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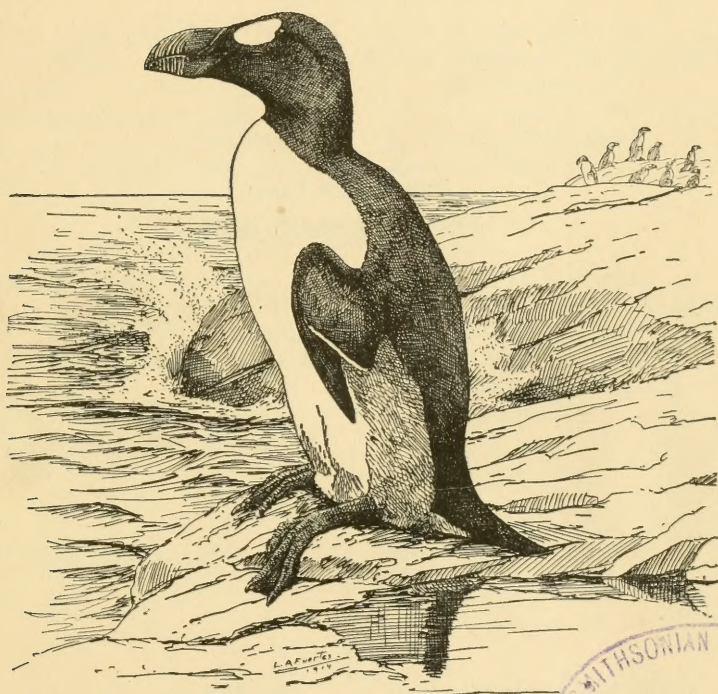
CONTINUATION OF THE
BULLETIN OF THE NUTTALL ORNITHOLOGICAL CLUB

NEW SERIES, }
Vol. XXXV. }

The Auk

A Quarterly Journal of Ornithology

EDITOR
WITMER STONE



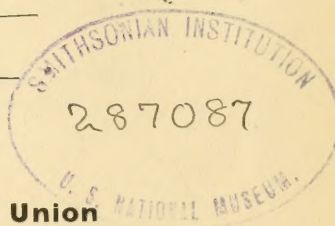
VOLUME XXXV

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WIDMANN, OTTO, 5105 Von Versen Ave., St. Louis, Mo.	1884

RETIRED FELLOWS.

LAWRENCE, NEWBOLD T., Lawrence, N. Y.	(1883)1913
STEJNEGER, DR. LEONHARD, U. S. Nat. Mus., Washington, D.C.(1883)1911	

HONORARY FELLOWS.

BUTURLIN, SERGIUS ALEXANDROVICH, Wessenberg, Esthonia, Russia	
	(1907)1916
DUBOIS, DR. ALPHONSE, Museum Natural History, Brussels. . .	(1884)1911
EVANS, ARTHUR HUMBLE, 9 Harvey Road, Cambridge, England	
	(1899)1917

FINSCH, Prof. Dr. OTTO, Leonhardplatz 5, Braunschweig, Germany . . .	1883
FÜRBRINGER, Prof. Dr. MAX, University of Heidelberg, Heidelberg, Germany	(1891) 1916
GADOW, Dr. HANS FRIEDRICH, Cambridge, England	(1884) 1916
GODMAN, FREDERICK DuCANE, 45 Pont St., London, S. W.	1883
HARTERT, ERNST, Zoölogical Museum, Tring, England	(1891) 1902
HELLMAYR, Dr. CARL E., Neuhauserstrasse 51.II, Munich, Germany	(1903) 1911
IHERING, Dr. HERMANN VON, Rua Consello, São Paulo, Brazil. (1902)	1911
PYCRAFT, WILLIAM PLANE, British Museum (Nat. Hist.) Cromwell Road, London, S. W.	(1902) 1911
REICHENOW, Dr. ANTON, Königl. Mus. für Naturkunde, Invaliden- strasse, 43, Berlin.	(1884) 1891
ROTHSCHILD, Lord LIONEL WALTER, Zoölogical Museum, Tring, Eng- land.	(1898) 1913
SALVADORI, Count TOMMASO, Royal Zoöl. Museum, Turin, Italy	1883
SCHALOW, Prof. HERMAN, Hohenzollerndamm 50, Berlin-Grünewald, Germany.	(1884) 1911
SCLATER, WM. LUTLEY, 10 Sloane Court, Chelsea, London, S. W.	1917

CORRESPONDING FELLOWS.

ABBOTT, Dr. WILLIAM L., Aldine Hotel, Philadelphia, Pa.	1916
ALFARO, ANASTASIO, San José, Costa Rica	1888
ALPHÉRAKY, SERGIUS N., Imperial Acad. Sci., Petrograd, Russia. . .	1913
ARRIGONI DEGLI ODDI, Count ETTORE, Univ. of Padua, Padua, Italy. 1900	
BANNERMAN, DAVID ARMITAGE, 11 Washington House, Basil St., Lon- don, England.	1916
BEDDARD, FRANK EVERS, Zoöl. Society of London, London, Eng. . . .	1917
BIANCHI, Dr. VALENTINE, Imperial Zoöl. Museum, Petrograd, Russia. 1916	
BONHOTE, JOHN LEWIS, Gade Spring Lodge, Hemel Hempstead, Herts, England.	1911
BUREAU, Dr. LOUIS, École de Médecine, Nantes, France	1884
BÜTTIKOFER, Dr. JOHANNES, Zoölogical Garden, Rotterdam, Holland. 1886	
CAMPBELL, ARCHIBALD JAMES, Custom House, Melbourne, Australia. 1902	
CARRIKER, M. A., Jr., Apartado 51, Santa Marta, Colombia. . . (1907)	1912
CHAMBERLAIN, MONTAGUE, Cambridge, Mass. (Founder)	1901
CHUBB, CHARLES, British Museum (Nat. Hist.) Cromwell Road, Lon- don, S. W.	1911
CLARKE, WILLIAM EAGLE, Royal Scottish Museum, Edinburgh.	1889
DABBENE, Dr. ROBERTO, Museo Nacional, Buenos Aires, Argentina. 1916	
DALGLEISH, JOHN J., Brankston Grange, Bogside Station, Alloa, Scotland.	1883

DOLE, SANFORD B., Honolulu, Hawaii.....	1883
ECHT, ADOLPH BACHOFEN VON, Nussdorf, near Vienna, Austria.....	1883
FEILDEN, COL. HENRY WEMYSS, Burwash, England.....	1884
FERRARI-PEREZ, Prof. FERNANDO, Tacubaya, D. F., Mexico.....	1885
FREKE, PERCY EVANS, Southpoint, Limes Road, Folkstone, England.....	1883
GODWIN-AUSTEN, Lieut.-Col. HENRY HAVERSHAM, Nore, Hascombe, Godalming, Surrey, England.....	1884
GRANDIDIER, ALFRED, 6 Rond-Point des Champs Elysées, Paris.....	1883
GURNEY, JOHN HENRY, Keswick Hall, Norwich, England.....	1883
HAAGNER, ALWYN KARL, Pretoria, Transvaal.....	1916
HALL, ROBERT, Rest Harrow, Hobart, Tasmania.....	1916
HARTING, JAMES EDMUND, Edgewood, Weybridge, Surrey, England.....	1883
HENNICKE, Dr. CARL R., Gera, Reuss, Germany.....	1907
HENSON, HARRY V., Yokohama Japan.....	1888
HUDSON, WILLIAM HENRY, Tower House, St. Luke's Road, West- bourne Park, London, W.....	1895
KRÜPER, Dr. THEOBALD J., University Museum, Athens, Greece.....	1884
LEGGE, Col. WILLIAM V., Cullenswood House, St. Mary's, Tasmania.....	1891
LE SOUËF, DUDLEY, Zoölogical Gardens, Melbourne, Australia.....	1911
LÖNNBERG, Dr. EINAR, Zoölogical Museum, Stockholm, Sweden.....	1916
LOWE, Dr. PERCY R., The Hatch, Windsor, England.....	1916
MACFARLANE, RODERICK, Winnipeg, Manitoba.....	1886
MADARÁSZ, Dr. JULIUS VON, National Museum, Budapest, Hungary.....	1884
MATHEWS, GREGORY M., Langley Mount, Watford, Herts, England.....	1911
MÉNÉGAUX, Dr. AUGUSTE, Paris, France.....	1916
MENZBIER, Prof. Dr. MICHAEL, Imperial Society of Naturalists, Moscow, Russia.....	1884
MILLAIS, JOHN GUILLE, Compton's Brow, Horsham, England.....	1911
NAMIYE, M., Tokio, Japan.....	1886
NICHOLSON, FRANCIS, The Knoll, Windermere, Westmoreland, Eng- land.....	1884
OGILVIE-GRANT, WILLIAM ROBERT, British Museum (Nat. Hist.), Cromwell Road, London, S. W.....	1899
PALMÉN, Dr. J. T., Helsingfors, Finland.....	1883
RINGER, FREDERIC, Nagasaki, Japan.....	1888
SNETHLAGE, Dr. EMILIA, Museu Goeldi, Pará, Brazil.....	1915
SUSCHKIN, Dr. PETER, University, Kharkov, Russia.....	1903
THEEL, Dr. JOHAN HJALMAR, University of Upsala, Upsala, Sweden.....	1884
TSCHUSI ZU SCHMIDHOFFEN, VICTOR, RITTER VON, Villa Tännenhof, bei Hallein, Salzburg, Austria.....	1884
VAN OORT, EDWARD DANIEL, Museum Nat. Hist., Leyden, Holland.....	1913
WATERHOUSE, F. H., 3 Hanover Square, London, W.....	1889
WINGE, Dr. HERLUF, Univ. Zoöl. Museum, Copenhagen, Denmark.....	1903
WITHERBY, HARRY FORBES, 3 Cannon Place, Hampstead, England.....	1916
WORCESTER, Prof. DEAN C., Manila, P. I.....	1903
ZELEDON, Don JOSÉ C., San José, Costa Rica.....	1884

MEMBERS.

- ALLEN, ARTHUR A., McGraw Hall, Cornell Univ., Ithaca, N. Y. (1909)1914
 ALLEN, FRANCIS H., 4 Park St., Boston, Mass. (1888)1901
 ALLEN, DR. GLOVER M., 234 Berkeley St., Boston, Mass. (1896)1904
 ANDERSON, DR. RUDOLPH M., Mus. Geol. Survey, Ottawa, Canada.
 (1907)1914
 ATTWATER, H. P., 2120 Genesee St., Houston, Texas. (1891)1901
 BAILEY, VERNON, 1834 Kalorama Ave., Washington, D. C. . . (1887)1901
 BAILEY, MRS. VERNON, 1834 Kalorama Ave., Washington, D. C. (1885)1901
 BAILY, WILLIAM L., Ardmore, Pa. (1886)1901
 BARBOUR, DR. THOMAS, Mus. Comp. Zoölogy, Cambridge, Mass. (1903)1914
 BARTSCH, PROF. PAUL, U. S. Nat. Museum, Washington, D. C. (1896)1902
 BECK, ROLLO HOWARD, San José, R. R. A., Cal. (1894)1917
 BERGTOLD, DR. W. H., 1159 Race St., Denver, Colo. (1889)1914
 BOND, FRANK, 3127 Newark St., N. W., Washington, D. C. . . (1887)1901
 BOWLES, JOHN HOOPER, The Woodstock, Tacoma, Wash. . . . (1891)1910
 BRAISLIN, DR. WILLIAM C., 425 Clinton Ave., Brooklyn, N. Y. . (1894)1902
 BROOKS, MAJOR ALLAN, Okanagan Landing, B. C. (1902)1909
 BROOKS, ENSIGN WM. SPRAGUE, 234 Berkeley St., Boston, Mass. (1907)1917
 BRYAN, WILLIAM ALANSON, College of Hawaii, Honolulu, Hawaiian
 Islands. (1898)1901
 BURNS, FRANK L., Berwyn, Pa. (1891)1901
 BUTLER, AMOS W., 52 Downey Ave., Irvington, Indianapolis, Ind. (1885)1901
 CHAMBERS, W. LEE, Eagle Rock, Cal. (1907)1913
 CHAPIN, LIEUT. JAMES P., Amer. Mus. Nat. Hist., New York, N. Y.
 (1906)1917
 CLARK, DR. HUBERT LYMAN, Mus. Comparative Zoöl. Cambridge, Mass.
 (1886)1902
 DAGGETT, FRANK S., Museum, Exposition Park, Los Angeles, Cal.
 (1889)1901
 DAWSON, WM. L., R. D., No. 3, Box 110, Santa Barbara, Cal. . (1895)1905
 DEANE, WALTER, 29 Brewster St., Cambridge, Mass. (1897)1901
 EATON, PROF. ELON HOWARD, 678 Main St., Geneva, N. Y. . . . (1895)1907
 EVERMANN, PROF. BARTON W., Cal. Acad. Sci., San Francisco, Cal.
 (1883)1901
 FINLEY, WILLIAM L., 651 East Madison St., Portland, Ore. . . (1904)1907
 GAULT, BENJAMIN TRUE, Glen Ellyn, Ill. (1885)1903
 GOLDMAN, MAJOR EDWARD A., Biological Survey, Washington, D. C.
 (1897)1902
 HARPER, FRANCIS, 3001 24th St. N. E., Washington, D. C. . . . (1907)1917
 HERSEY, F. SEYMOUR, 6 Maple Ave., Taunton, Mass. (1911)1916
 HOFFMANN, RALPH, 5554 Waterman Ave., St. Louis, Mo. (1893)1901

HOLLISTER, NED, Nat. Zoölogical Park, Washington, D. C.....	(1894)1910
HOWELL, A. BRAZIER, Covina, Cal.....	(1909)1916
HOWELL, ARTHUR H., 2919 S. Dakota Ave., Washington, D. C.....	(1889)1902
JACOBS, J. WARREN, 404 S. Washington St., Waynesburg, Pa.....	(1889)1904
JEFFRIES, WILLIAM A., 11 Pemberton Square, Boston, Mass.....	(1883)1901
JOB, HERBERT K., 291 Main St., West Haven, Conn.....	(1896)1901
KALMBACH, EDWIN R., Biological Survey, Washington, D. C.....	(1910)1915
KENNARD, F. H., Dudley Road, Newton Centre, Mass.....	(1892)1912
KNOWLTON, F. H., U. S. Nat. Mus., Washington, D. C.....	(1883)1902
LAW, J. EUGENE, 833½ S. Catalina St., Los Angeles.....	(1907)1916
MACKAY, GEORGE H., 304 Bay State Road, Boston, Mass.....	(1890)1901
MAILLIARD, JOHN W., 230 California St., San Francisco, Cal.	(1895)1901
MILLER, MRS. OLIVE THORNE, 5928 Hays Ave., Los Angeles, Cal.....	(1887)1901
MOORE, ROBERT THOMAS, Haddonfield, N. J.....	(1898)1914
MORRIS, GEORGE SPENCER, Olney, Philadelphia, Pa.....	(1887)1903
MORRIS, ROBERT O., 82 Temple St., Springfield, Mass.....	(1888)1904
MURDOCH, JOHN, 16 High Rock Way, Allston, Mass.....	(1883)1901
MURPHY, ROBERT C., Museum Brooklyn Institute, Eastern Parkway, Brooklyn, N. Y.....	(1905)1914
NICHOLS, JOHN T., Am. Mus. Nat. Hist., New York, N. Y....	(1901)1914
NORTON, ARTHUR H., Mus. Nat. Hist., 22 Elm St., Portland, Me.....	(1890)1902
PEARSON, T. GILBERT, 1974 Broadway, New York, N. Y.....	(1891)1902
PHILLIPS, Capt. JOHN C., Wenham, Mass.....	(1904)1912
PREBLE, EDWARD A., Biological Survey, Washington, D. C.....	(1892)1901
RATHBUN, SAMUEL F., 217 14th Ave., N., Seattle, Wash.....	(1893)1902
RHOADS, SAMUEL N., 81 Haddon Ave., Haddonfield, N. J.....	(1885)1901
RILEY, JOSEPH H., U. S. National Museum, Washington, D. C.....	(1897)1905
RIVES, Dr. WILLIAM C., 1702 Rhode Island Ave., Washington, D. C. (1885)1901	
ROBINSON, Col. WIRT, U. S. A., West Point, N. Y.....	(1897)1901
SETON, ERNEST THOMPSON, Greenwich, Conn.....	(1883)1901
*SHERMAN, Miss ALTHEA R., National via McGregor, Iowa.....	(1907)1912
SHIRAS, Hon. GEORGE, 3d, Stoneleigh Court, Washington, D. C.....	(1907)1915
STEPHENS, FRANK, Nat. Hist. Museum, Balboa Park, San Diego, Cal. (1883)1901	
STRONG, Dr. REUBEN M., Vanderbilt Medical School, Nashville, Tenn. (1889)1903	
SWALES, BRADSHAW HALL, Mus. of Zoöl., Ann. Arbor, Mich.....	(1902)1909
THAYER, JOHN ELIOT, Lancaster, Mass.....	(1898)1905
TOWNSEND, Dr. CHARLES H., Aquarium, Battery Park, New York, N. Y. (1883)1901	
TOWNSEND, Dr. CHARLES WENDELL, 76 Marlborough St., Boston, Mass.	(1901)1905

TROTTER, DR. SPENCER, Swarthmore College, Swarthmore, Pa.	(1888)1901
TYLER, DR. WINSOR M., 522 Mass. Ave., Lexington, Mass.	(1912)1917
WARREN, EDWARD ROYAL, 1511 Wood Ave., Colorado Springs, Colo.	(1902)1910
WAYNE, ARTHUR T., Mt. Pleasant, S. C.	(1905)1906
WETMORE, ALEX., Biological Survey, Washington, D. C.	(1908)1912
WILLETT, GEORGE, 2123 Court St., Los Angeles, Cal.	(1912)1913
WOLCOTT, DR. ROBERT H., State University, Lincoln, Neb.	(1901)1903
WOOD, NORMAN A., Museum Univ. of Mich., Ann. Arbor, Mich.	(1904)1912
WRIGHT, MRS. MABEL OSGOOD, Fairfield, Conn.	(1895)1901

ASSOCIATES.

ABBOTT, CLINTON GILBERT, Orchard Hill, Rhinebeck, N. Y.	1898
ABBOTT, MISS FLORENCE I., Upland Road, Andover, Mass.	1917
ADAMS, BENJAMIN, 476 5th Ave., New York, N. Y.	1911
ADAMS, WALLACE, U. S. Indian Service, Florence, Ariz.	1901
ADAMS, DR. Z. B., 43 Cottage Farm Rd., Brookline, Mass.	1908
AIKEN, HON. JOHN, Superior Court, Court House, Boston, Mass.	1905
AIMAR, DR. CHARLES PONS, 4 Vanderhorst St., Charleston, S. C.	1916
ALEXANDER, MISS ANNIE M., 92 Sea View Ave., Piedmont, Cal.	1911
ALLEN, MRS. J. T., 37 Mosswood Road, Berkeley, Cal.	1916
ALLEN, MARY P., 206 Moore St., Hackettstown, N. J.	1913
ANDERSON, MRS. J. C., Great Barrington, Mass.	1903
ANGELL, WALTER A., 33 Westminster St., Providence, R. I.	1901
ANTHONY, LIEUT. H. E., Amer. Mus. Nat. Hist., New York, N. Y.	1911
APPEL, WM. D., Kingsport, Tenn.	1917
AREY, DR. HAROLD C., Hospital Cottages for Children, Baldwinville, Mass.	1917
ARMSTRONG, EDWARD, E., 207 N. Michigan Ave., Chicago, Ill.	1904
ARNOLD, EDWARD, Grand Trunk R'y., Montreal, Quebec.	1894
ARNOLD, DR. W. W., 1st Nat. Bank Bldg., Colorado Springs, Colo.	1910
ARTHUR, STANLEY CLISBY, 1109 Henry Clay Ave., New Orleans, La.	1916
ASPINWALL, MRS. CLARENCE A., 1839 Wyoming Ave., Washington, D. C.	1916
ATHERTON, EDWARD H., 82 Ruthven St., Roxbury, Mass.	1917
AVIS, EDWARD, Box 56, Enfield, Conn.	1908
AYRES, MISS MARY ADELINE, 119 High St., Medford, Mass.	1915
BABCOCK, DEAN, Long's Peak, Colo.	1911
BABCOCK, LIEUT. HAROLD LESTER, Woodleigh Road, Dedham, Mass.	1916
BACON, FRANCIS L., 236 Winona Ave., Germantown, Pa.	1917
BADÉ, DR. WM. FREDERIC, 2616 College Ave., Berkeley, Cal.	1916

BADGER, ARTHUR C., Dudley Road, Newton Centre, Mass.....	1917
BAGG, AARON C., 70 Fairfield Ave., Holyoke, Mass.....	1916
BAGG, EGBERT, JR., 406 Genesee St., Utica, N. Y.....	1916
BAILEY, Prof. GUY A., Geneseo, N. Y.....	1910
BAILEY, SAMUEL WALDO, 64 S. Mountain Road, Pittsfield, Mass....	1909
BAKER, Lieut. JOHN H., Nat. Cash Register Co., Dayton, Ohio.....	1911
BALDWIN, ROGER N., 3739 Windsor Place, St. Louis, Mo.....	1904
BALDWIN, S. PRENTISS, Williamson Bldg., Cleveland, Ohio.....	1917
BALES, Dr. BLENN R., 149 W. Main St., Circleville, Ohio.....	1907
BALL, Mrs. BENNET F., Oakville, Conn.....	1905
BALL, DAVID S., Spuyten Duyvil, New York, N. Y.....	1913
BALL, Dr. JAS. P., 5001 Frankford Ave., Philadelphia, Pa.....	1911
BARBOUR, Rev. ROBERT, Y. M. C. A., Montclair, N. J.....	1902
BARKER, Mrs. MERLE TAFT, 178 High St., Taunton, Mass.....	1915
BARNARD, Judge JOB, 1306 Rhode Island Ave., Washington, D. C....	1886
BARNES, CLAUDE T., 359 Tenth Ave., Salt Lake City, Utah.....	1908
BARNES, Hon. R. MAGOON, Lacon, Ill.....	1889
BARRETT, CHAS. H. M., 1339 Valley Place, S. E., Washington, D. C....	1912
BARRETT, HAROLD LAWRENCE, 704 Centre St., Jamaica Plain, Mass....	1909
BARRY, Miss ANNA K., 5 Bowdoin Ave., Dorchester, Mass.....	1907
BARTLETT, HENRY, 49 Middle St., Acushnet, Mass.....	1917
BARTLETT, Miss MARY F., 227 Commonwealth Ave., Boston, Mass....	1912
BARTRAM, EDWIN B., Strafford, Pa.....	1913
BACHELOR, MARION W., 27 Jassen Place, Kansas City, Mo.....	1916
BATTEN, GEORGE, JR., 93 Union St., Montclair, N. J.....	1914
BEMIS, BENJ. FRANKLIN, Gleasondale, Mass.....	1916
BELL, Dr. W. B., 803 Rittenhouse St., N. W. Washington, D. C....	1912
BENNETT, WILLIAM J., 1941 1st St. N. W., Washington, D. C.....	1901
BENSON, C. STANLEY, 75 Plymouth St., North Abington, Mass.....	1915
BICKNELL, Mrs. F. T., 319 S. Normandie Ave., Los Angeles, Cal....	1913
BIDDLE, Miss EMILY WILLIAMS, 2201 Sansom St., Philadelphia, Pa....	1898
BIGELOW, Dr. LYMAN F., 80 Winter St., Norwood, Mass.....	1914
BLACKWELDER, ELIOT, Natural History Bldg., Urbana, Ill.....	1895
BLOOMFIELD, Mrs. C. C., 723 Main St., W., Jackson, Mich.....	1901
BOARDMAN, Miss E. D., 416 Marlborough St., Boston, Mass.....	1906
BODINE, Mrs. DONALDSON, 4 Mills Place, Crawfordsville, Ind.....	1916
BOGARDUS, Miss CHARLOTTE, Elm St., Coxsackie, N. Y.....	1909
BOGERT, WILLIAM S., 2610 Eldridge St., Bellingham, Wash.....	1904
BOLLES, Mrs. FRANK, 6 Berkeley St., Cambridge, Mass.....	1912
BOLT, BENJAMIN FRANKLIN, 1421 Prospect Ave., Kansas City, Mo....	1909
BOND, HARRY L., Lakefield, Minn.....	1908
BORLAND, Wm. G., 7 Wall St., New York, N. Y.....	1911
BOSSON, CAMPBELL, 30 State St., Boston, Mass.....	1906
BOULTON, W. RUDYUD, JR., 338 1st St., Beaver, Pa.....	1915
BOURNE, THOS. L., Hamburg, N. Y.....	1914
BOWDISH, B. S., Demarest, N. J.....	1891

BOWDISH, Mrs. B. S., Demarest, N. J.....	1902
BOWDITCH, Dr. HAROLD, 60 Harvard Ave., Brookline, Mass.....	1900
BOWDITCH, JAMES H., 903 Tremont Bldg., Boston, Mass.....	1913
BOYD, Mrs. HARRIET T., 17 Marsh St., Dedham, Mass.....	1917
BOYLE, HOWARTH S., Amer. Mus. Nat. Hist., New York, N. Y.....	1916
BOYNTON, CHARLES T., 1005 S. Sheridan Road, Highland Park, Ill..	1912
BRACKEN, Mrs. HENRY M., 1010 Fourth St., S.E., Minneapolis, Minn..	1897
BRADBURY, W. C., 1440 Race St., Denver, Colo.....	1915
BRADLEE, THOMAS STEVENSON, Somerset Club, Boston, Mass.....	1902
BRAINERD, BARRON, 57 Monmouth St., Brookline, Mass.....	1917
BRANDRETH, COURTENAY, Ossining, N. Y.....	1905
BRANDRETH, FRANKLIN, Ossining, N. Y.....	1889
BRANDT, HERBERT W., 2025 East 88th St., Cleveland, Ohio.....	1915
BREWSTER, EDWARD EVERETT, 316 East C St., Iron Mountain, Mich.	1893
BREWSTER, Mrs. WILLIAM, 145 Brattle St., Cambridge, Mass.....	1912
BRIDGE, EDMUND, 52 Wyman St., West Medford, Mass.....	1910
BRIDGE, Mrs. EDMUND, 52 Wyman St., West Medford, Mass.....	1902
BRIGGS, JOSEPH S., 1372 Powell St., Norristown, Pa.....	1916
BRIMLEY, H. H., Raleigh, N. C.....	1904
BRISTOL, JOHN I. D., 1 Madison Ave., New York, N. Y.....	1907
BRITTEN, G. S., 807 Walnut Ave., Syracuse, N. Y.....	1913
BROCK, Dr. HENRY HERBERT, 687 Congress St., Portland, Me.....	1894
BROCKWAY, ARTHUR W., Hadlyme, Conn.....	1912
BROOKS, Rev. EARLE AMOS, 419 N. River Ave., Weston, W. Va....	1892
BROOKS, MAURICE GRAHAM, French Creek, W. Va.....	1915
BROWN, Miss ANNIE H., 31 Maple St., Stoneham, Mass.....	1909
BROWN, EDWARD J., 1609 S. Van Ness Ave., Los Angeles, Cal.....	1891
BROWN, G. FRANKLIN, "Stonebridge," Needham, Mass.....	1917
BROWN, HARRY A., 40 Talbot St., Lowell, Mass.....	1912
BROWN, Mrs. HENRY TEMPLE, Lancaster, Mass.....	1912
BROWN, PHILIP G., 85 Vaughan St., Portland, Me.....	1911
BROWN, STEWARDSON, 20 E. Penn St., Germantown, Philadelphia, Pa.	1895
BROWN, Wm. JAMES, 250 Oliver Ave., Westmount, Quebec.....	1908
BROWNING, Wm. HALL, 16 Cooper Square, New York, N. Y.....	1911
BRUEN, FRANK, 69 Prospect St., Bristol, Conn.....	1908
BRUMBAUGH, CHALMERS S., 1020 Cathedral St., Baltimore, Md....	1916
BRYANT, HAROLD CHILD, Mus. Vert. Zool., Univ. of California, Berkeley, Cal.....	1913
BUNKER, CHARLES D., Kansas Univ. Museum, Lawrence, Kan.....	1916
BURGESS, JOHN KINGSBURY, "Broad Oak," Dedham, Mass.....	1898
BURLEIGH, THOS. D., 825 N. Negley Ave., Pittsburgh, Pa.....	1913
BURNETT, WILLIAM L., State Agric. College, Fort Collins, Colo.....	1895
BURTCH, VERDI, Branchport, N. Y.....	1903
BURTON, E. ROY, 60 Park Ave., Delaware, Ohio.....	1916
BUTTERWICK, CLAUDE A., 116 Broad St., Telford, Pa.....	1917
CADUC, EUGENE E., 512 Massachusetts Ave., Boston, Mass.....	1910

CAESAR, HENRY A., 50 Union Square, New York, N. Y.....	1916
CAHN, ALVIN R., 4720 Greenwood Ave., Chicago, Ill.....	1917
CALLENDER, JAMES PHILLIPS, 32 Broadway, New York, N. Y.....	1903
CAMPBELL, MRS. J. B., 263 W. 7th St., Erie, Pa.....	1917
CANTWELL, GEORGE G., 901 W. Main Ave., Puyallup, Wash.....	1916
CARNE, MRS. THOMAS, 41 Melrose St., Adams, Mass.....	1917
CARPENTER, REV. CHARLES KNAPP, 174 Forest Ave., Oak Park, Ill..	1894
CARPENTER, GEORGE I., 129 Dean St., Brooklyn, N. Y.....	1907
CARPENTER, HALL B., Kappa Sigma House, Amherst, Mass.....	1916
CARRIGER, H. W., 5185 Trask St., Fruitvale Station, Oakland, Cal..	1913
CARTER, JOHN D., Lansdowne, Pa.....	1907
CASH, HARRY A., 448 Hope St., Providence, R. I.....	1898
CHAMBERLAIN, CHAUNCY W., 36 Lincoln St., Boston, Mass.....	1885
CHAPIN, Prof. ANGIE CLARA, Wellesley College, Wellesley, Mass...	1896
CHAPMAN, MRS. F. M., Englewood, N. J.....	1908
CHAPMAN, ROYAL N., Dept. Animal Biology, Univ. of Minnesota, Minneapolis, Minn.....	1911
CHASE, SIDNEY, Nantucket, Mass.....	1904
CHEESMAN, MORTON R., R. F. D. 3, Box 61, Murray, Utah.....	1911
CHENEY, REV. ROBERT F., Southboro, Mass.....	1917
CHRISTY, BAYARD H., 403 Frederick Ave., Sewickley, Pa.....	1901
CLARK, CHARLES A., 60 Lynnfield St., East Lynn, Mass.....	1917
CLARK, CLARENCE H., Lubec, Me.....	1913
CLARK, JOSIAH H., 238 Broadway, Paterson, N. J.....	1895
CLARKE, CHARLES E., 11 Chetwynd Road, Tufts College, Mass.....	1907
CLARKE, MISS HARRIET E., 9 Chestnut St., Worcester, Mass.....	1896
CLARKE, MISS MARY F., Bristow, Va.....	1916
CLEAVES, HOWARD H., Public Museum, New Brighton, N. Y.....	1907
CLEVELAND, Dr. CLEMENT, 925 Park Ave., New York, N. Y.....	1903
CLEVELAND, MISS LILIAN, Woods Edge Road, West Medford, Mass..	1906
COALE, HENRY K., Highland Park, Ill.....	1883
COBB, MISS ANNIE W., 20 Amsden St., Arlington, Mass.....	1909
COBB, PHILIP HACKER, 35 Matthews Hall, Cambridge, Mass.....	1917
COBB, Dr. STANLEY, 206 E. Chase St., Baltimore, Md.....	1909
CODY, Prof. WALTER GUYTON, 69 High St., Middletown, Conn.....	1916
COFFIN, MRS. PERCIVAL B., 3232 Groveland Ave., Chicago, Ill.....	1905
COFFIN, ROBERT L., Mass. Agric'l. Exp. Sta., Amherst, Mass.....	1917
COGGINS, HERBERT L., 463 114th St., Oakland, Cal.....	1913
COLBURN, ALBERT E., 806 S. Broadway, Los Angeles, Cal.....	1891
COLE, Dr. LEON J., College of Agric., Univ. of Wis., Madison, Wis...	1908
COMMONS, MRS. F. W., 608 Chamber of Commerce, Minneapolis, Minn.	1902
CONE, Mrs. HENRY F., 4 Trinity St., Hartford, Conn.....	1917
CONEY, Mrs. GEO. H., R. F. D., Box 25, Windsor, Conn.....	1906
COOK, FREDERICK W., 1604 East Harrison St., Seattle, Wash.....	1915
COOK, MISS LILIAN GILLETTE, Long Lea, Amherst, Mass.....	1899
COOKE, GEORGE J., Ambler, Pa.....	1916

COOKE, Miss MAY THACHER, 1328 Twelfth St., Washington, D. C. . . .	1915
COPE, FRANCIS R., Jr., Dimock, Pa.	1892
COPELAND, Miss ADA B., 1103 White Ave., Grand Junction, Colo. . . .	1917
COPELAND, MANTON, 88 Federal St., Brunswick, Me.	1900
CORRINGTON, JULIAN DANA, 406 University Ave., Ithaca, N. Y.	1916
CRAIG, WALLACE, Univ. of Maine, Orono, Me.	1912
CRAM, R. J., 26 Hancock Ave., W., Detroit, Mich.	1893
CRANDALL, LEE S., N. Y. Zoöl. Park, New York, N. Y.	1909
CRANE, Miss CLARA L., Dalton, Mass.	1904
CRANE, Mrs. ZENAS, Dalton, Mass.	1904
CREHORE, FREDERIC M., Box 1252, Boston, Mass.	1913
CRESSY, Mrs. A. S., 27 Baltimore St., Hartford, Conn.	1912
CROSBY, MAUNSELL S., Rhinebeck, N. Y.	1904
CUMMINGS, Miss EMMA G., 16 Kennard Road, Brookline, Mass.	1903
CURRIE, ROLLA P., 632 Keefer Place, N. W., Washington, D. C. . . .	1895
CURRIER, EDMONDE SAMUEL, 416 E. Chicago St., Portland, Ore.	1894
CURRY, HASKELL BROOKS, 60 Bay State Road, Boston, Mass.	1916
CURTIS, CHARLES P., 244 Beacon St., Boston, Mass.	1915
CUSHMAN, Miss ALICE, 919 Pine St., Philadelphia, Pa.	1910
DANA, Wm. SHEPHERD, Moriches, N. Y.	1916
DANE, Mrs. ERNEST B., Chestnut Hill, Mass.	1912
DANFORTH, STUART F., 115 N. 6th Ave., New Brunswick, N. J.	1916
DANKERS, CHARLES E., Corning, Mo.	1916
DAVENPORT, Mrs. ELIZABETH B., Brattleboro, Vt.	1898
DAVIDSON, Mrs. GAYLORD, 1302 W., S. Grand Ave., Springfield, Ill. . .	1912
DAVIS, CHARLES H., 700 N. Hamilton St., Saginaw, W. S., Mich. . . .	1906
DAY, CHESTER SESSIONS, 1711 Commonwealth Ave., Boston, Mass. . .	1897
DEAN, R. H., 720 Quintard Ave., Anniston, Ala.	1913
DEANE, GEORGE CLEMENT, 80 Sparks St., Cambridge, Mass.	1899
DECKER, HAROLD K., 250 Livermore Ave., West New Brighton, N. Y. .	1916
DELOACH, R. J. H., 6605 Harvard Ave., Chicago, Ill.	1910
DENSMORE, Miss MABEL, 910 4th St., Red Wing, Minn.	1910
DERBY, Major RICHARD, 116 E. 79th St., New York, N. Y.	1898
DERBY, WILLIAM M., Jr., 4857 Kimbark Ave., Chicago, Ill.	1916
DEWEY, Dr. CHARLES A., 78 Plymouth Ave., Rochester, N. Y.	1900
DEXTER, LEWIS, 1889 Elm St., Manchester, N. H.	1915
DICKEY, DONALD R., San Rafael Heights, Pasadena, Cal.	1907
DICKEY, SAMUEL S., Waynesburg, Pa.	1905
DILL, Prof. HOMER R., State Univ. of Iowa, Iowa City, Ia.	1916
DILLE, FREDERICK M., Valentine, Neb.	1892
DIMICK, CHARLES W., 1007 Tremont Bldg., Boston, Mass.	1917
DIONNE, C. E., Laval University, Quebec, Canada.	1893
DIXON, FREDERICK J., 111 Elm Ave., Hackensack, N. J.	1891
DIXON, JOSEPH S., Univ. of Cal., Berkeley, Cal.	1917
DORN, Prof. LOUIS, Concordia College, Fort Wayne, Ind.	1912
DRUMMOND, Miss MARY, 510 Spring Lane, Lake Forest, Ill.	1904
DULL, Mrs. A. P. L., 211 N. Front St., Harrisburg, Pa.	1900

DURFEE, OWEN, Box 125, Fall River, Mass.....	1887
DURYEA, MISS ANNIE B., 62 Washington St., Newark, N. J.....	1911
DYKE, ARTHUR CURTIS, 205 Summer St., Bridgewater, Mass.....	1902
EASTMAN, Major FRANCIS B., Camp Grant, Ill.....	1909
EATON, Miss MARY S., 8 Monument St., Concord, Mass.....	1909
EATON, SCOTT HARRISON, Box 653, Lawrenceville, Ill.....	1912
EDSON, JOHN M., Marietta Road, Bellingham, Wash.....	1886
EDSON, WM. L. G., 54 Fairview Avenue, Rochester, N. Y.....	1916
EHINGER, Dr. CLYDE E., 100 W. Rosedale Ave., West Chester, Pa....	1904
EIFRIG, Prof. C. W. GUSTAVE, 504 Monroe Ave., Oak Park, Ill.....	1901
EIMBECK, Dr. AUGUST F., New Haven, Mo.....	1906
EKBLAW, WALTER ELMER, 255 Nat. Hist. Bldg., Urbana, Ill.....	1911
ELDRIDGE, ARTHUR S., South Lincoln, Mass.....	1912
ELLIOT, Mrs. J. W., 124 Beacon St., Boston, Mass.....	1912
ELLS, GEORGE P., Norwalk, Conn.....	1904
EMERSON, W. OTTO, Hayward, Cal.....	1916
EMMONS, RUPERT A., Chester, Conn.....	1913
EMORY, Mrs. MARY DILLE, 156 Foundry St., Morgantown, W. Va....	1899
ERRETT, RUSSELL, Terrace Park, Ohio.....	1915
EVANS, Dr. EVAN M., 56 East 55th St., New York, N. Y.....	1916
EVANS, WILLIAM B., Moorestown, N. J.....	1897
FANNING, Dr. WALTER G., 2 Hunt St., Danvers, Mass.....	1917
FARLEY, JOHN A., 52 Cedar St., Malden, Mass.....	1904
FARQUHAR, ARTHUR, York, Pa.....	1916
FARRAR, EDWARD ROGERS, South Lincoln, Mass.....	1917
FAXON, ALLAN HART, 7 Edwards St., Southbridge, Mass.....	1916
FAY, DUDLEY B., 287 Beacon St., Boston, Mass.....	1916
FAY, Lieut. S. PRESCOTT, 53 State St., Boston, Mass.....	1907
FELGER, ALVA HOWARD, North Side High School, Denver, Colo....	1898
FELL, Miss EMMA TREGO, 1534 N. Broad St., Philadelphia, Pa.....	1903
FIELD, Dr. GEORGE W., Biological Survey, Washington, D. C.....	1910
FINNEY, Mrs. E. S., St. Davids, Pa.....	1916
FISHER, Miss ELIZABETH WILSON, 2222 Spruce St., Philadelphia, Pa..	1896
FISHER, Dr. G. CLYDE, American Mus. Nat. Hist., New York, N. Y..	1908
FLANAGAN, JOHN H., 89 Power St., Providence, R. I.....	1898
FLEISCHER, EDWARD, 1591 Union St., Brooklyn, N. Y.....	1916
FLETCHER, Mrs. MARY E., Proctorsville, Vt.....	1898
FLOYD, CHARLES BENTON, 19 Woodbine St., Auburndale, Mass....	1916
FOOT, Dr. NATHAN CHANDLER, Hyde Park, Mass.....	1916
FOOTE, Miss F. HUBERTA, 260 Valentine Lane, Yonkers, N. Y.....	1897
FORBES, ALEXANDER, Milton, Mass.....	1912
FORBES, RALPH E., 328 Adams St., Milton, Mass.....	1917
FORDYCE, GEO. L., 40 Lincoln Ave., Youngstown, Ohio.....	1901
FOSTER, FRANK B., Haverford, Pa.....	1916
FOWLER, FREDERICK HALL, 221 Kingsley Ave., Palo Alto, Cal....	1892
FOWLER, HENRY W., Acad. Nat. Sciences, Philadelphia, Pa.....	1898

FOX, DR. WILLIAM H., 1826 Jefferson Place, Washington, D. C.....	1883
FRANCIS, NATHANIEL A., 35 Davis Ave., Brookline, Mass.....	1913
FRASER, DONALD, Johnstown, N. Y.....	1902
FREEMAN, MISS HARRIET E., 37 Union Park, Boston, Mass.....	1903
FRENCH, CHARLES H., Canton, Mass.....	1904
FRENCH, MRS. CHAS. H., Canton, Mass.....	1908
FROTHINGHAM, MRS. RANDOLPH, The Copley Plaza, Boston, Mass.....	1913
FRY, HENRY J., 152 W. Lincoln Ave., Mt. Vernon, N. Y.....	1916
FULLER, HENRY C., 1348 Euclid St., Washington, D. C.....	1916
FULLER, MRS. T. OTIS, Needham, Mass.....	1909
GABRIELSON, IRA N., Biological Survey, Washington, D. C.....	1912
GANIER, ALBERT F., 1221 17th Ave., S., Nashville, Tenn.....	1917
GARDINER, CHARLES BARNES, 175 W. Main St., Norwalk, Ohio....	1903
GARST, DR. JULIUS, 29 Oread St., Worcester, Mass.....	1916
GERTKEN, PROF. SEVERIN, St. John's University, Collegeville, Minn..	1912
GIANINI, CHAS. A., Poland, N. Y.....	1911
GIBSON, LANGDON, 5 Union St., Schenectady, N. Y.....	1887
GILCHRIST, DONALD A., Care of Extension Service, Tucson, Ariz....	1917
GILMAN, M. FRENCH, Fort Bidwell, Cal.....	1907
GLADDING, MRS. JOHN R., 30 Stimson Ave., Providence, R. I.....	1912
GLEASON, MRS. C. H., 700 Madison Ave., S. E., Grand Rapids, Mich.	1917
GODING, EDWARD N., 73 Tremont St., Boston, Mass.....	1916
GOELITZ, WALTER A., 1622 Judson Ave., Ravinia, Ill.....	1916
GOLDMAN, LUTHER J., Pocatello, Idaho.....	1916
GOLSAN, LEWIS S., Box 97, Prattville, Ala.....	1912
GOODRICH, MISS JULIET T., 1210 Astor St., Chicago, Ill.....	1904
GORDON, HARRY E., 168 Asbury St., Rochester, N. Y.....	1911
GORST, CHARLES C., 2 Arnold Circle, Cambridge, Mass.....	1916
GOULD, ALFRED M., Malden, Mass.....	1916
GOULD, JOSEPH E., Arcadia, Fla.....	1889
GRAHAM, WM. J., Aledo, Ill.....	1909
GRANGER, MISS HELEN, Peterborough, N. H.....	1904
GRANGER, WALTER, Amer. Mus. Nat. Hist., New York, N. Y.....	1891
GRANT, WM. W., 600 Castle St., Geneva, N. Y.....	1910
GRAVES, MRS. CHARLES B., 4 Mercer St., New London, Conn.....	1905
GRAY, GEORGE M., Box 89, Woods Hole, Mass.....	1916
GREEN, HORACE OAKES, 114 North Ave., Wakefield, Mass.....	1917
GREENOUGH, HENRY VOSE, 1134 Beacon St., Brookline, Mass.....	1901
GREENWOOD, FREDERICK, 1724 8th Ave., Spokane, Wash.....	1917
GREGORY, RAYMOND J., Princeton, Mass.....	1917
GREGORY, STEPHEN S., Jr., 52 Cedar St., Chicago, Ill.....	1916
GRIFFIN, BERTRAM S., 22 Currier Ave., Haverhill, Mass.....	1917
GRISCOM, LIEUT. LUDLOW, 20 Fifth Ave., New York, N. Y.....	1908
GROW, MRS. EUGENE J., Lebanon, N. H.....	1916
GUILD, HENRY R., 102 Beacon St., Boston, Mass.....	1912
HADLEY, ALDEN H., Monrovia, Indiana.....	1906

HAGAR, Lieut. J. A., 79 Washington Park, Newtonville, Mass.....	1914
HAGER, GEORGE W., R. F. D. 3, Peterboro, N. H.....	1917
HALL, F. GREGORY, Milton, Wis.....	1917
HALL, WM. WEBSTER, Jr., 15 East 75th St., New York, N. Y.....	1917
HANDLEY, CHARLES O., Lewisburg, W. Va.....	1916
HANKINSON, THOS. LEROY, 900 11th St., Charleston, Ill.....	1897
HARDON, MRS. HENRY W., Wilton, Conn.....	1905
HARRINGTON, RALPH M., 953 Central Y. M. C. A., Brooklyn, N. Y....	1915
HARRIS, HARRY, Kansas City, Mo.....	1911
HARRISON, RICHARD C., 142 Huntington St., New Haven, Conn....	1916
HARVEY, JOHN L., Mercantile Bldg., Waltham, Mass.....	1916
HASKELL, Miss SADIA, 1209 12th St., N. W., Washington, D. C....	1916
HATCH, Dr. ROYAL, 578 Washington St., Wellesley, Mass.....	1916
HATHAWAY, HARRY S., Box 1466, Providence, R. I.....	1897
HAVEMEYER, H. O., Jr., Mahwah, N. J.....	1893
HELME, ARTHUR H., Miller Place, N. Y.....	1888
HENDERSON, Judge JUNIUS, 627 Pine St., Boulder, Colo.....	1903
HENDERSON, WALTER C., 4727 13th St., N. W., Washington, D.C....	1917
HENDRICKSON, W. F., 276 Hillside Ave., Jamaica, N. Y.....	1885
HENNESSEY, FRANK C., 457 Albert St., Ottawa, Canada.....	1914
HERMANN, THEODORE L., 273 Neal Dow Ave., W. New Brighton, N.Y.	1916
HERRICK, FRANCIS H., Adelbert College, Cleveland, Ohio.....	1913
HERRICK, HAROLD, 123 William St., New York, N. Y.....	1905
HERRICK, NEWBOLD L., Cedarhurst, N. Y.....	1913
HERRICK, N. LAWRENCE, Jr., Cedarhurst, N. Y.....	1917
HILL, JAMES HAYNES, Box 485, New London, Conn.....	1897
HILL, MRS. THOMAS R., Box 491, Chautauqua, N. Y.....	1903
HINCKLEY, GEO. LYMAN, Redwood Library, Newport, R. I.....	1912
HINE, Prof. JAMES STEWART, Ohio State Univ., Columbus, Ohio....	1899
HIX, GEORGE E., 100 W. 91st St., New York, N. Y.....	1904
HOLLAND, HAROLD MAY, 320 S. Grammercy Place, Los Angeles, Cal. .	1910
HOLLAND, Dr. WILLIAM J., Carnegie Museum, Pittsburgh, Pa.....	1899
HOLLISTER, WARREN D., 2527 Allison St., Denver, Colo.....	1901
HOLMAN, RALPH H., 33 Chestnut St., Stoneham, Mass.....	1907
HOLT, ERNEST G., Biological Survey, Washington, D. C.....	1911
HOLTON, OLIVER W., 107 Edgemoor Lane, Ithaca, N. Y.....	1916
HONYWILL, ALBERT W., Jr., 31 Barker Ave., Hartford, Conn.....	1907
HORSFALL, ROBERT BRUCE, 1457 E. 18th St., Portland, Ore.....	1905
HORTON, ISAAC CHESTER, 2207 Washington St., Canton, Mass.....	1916
HOTCHKISS, HIRAM A., Harding, Mass.....	1917
HOWLAND, R. H., 164 Wildwood Ave., Upper Montclair, N. J.....	1903
HOYT, WILLIAM H., Box 425, Stamford, Conn.....	1907
HUBBARD, C. ANDRESEN, 1249 E. Harrison St., Portland, Ore.....	1916
HUBBARD, Prof. MARIAN E., Wellesley College, Wellesley, Mass....	1916
HUBBARD, RALPH, 516 Stewart Ave., Ithaca, N. Y.....	1916
HUBBARD, MRS. SARA A., 177 Woodruff Ave., Brooklyn, N. Y.....	1891
HUBER, WHARTON, Gwynedd Valley, Pa.....	1915

HUNN, JOHN T. SHARPLESS, 1218 Prospect Ave., Plainfield, N. J.	1895
HUSSEY, ROLAND F., 1308 E. Anne St., Ann Arbor, Mich.	1915
INGERSOLL, ALBERT M., 908 F St., San Diego, Cal.	1885
ISHAM, CHAS. B., 27 W. 67 St., New York, N. Y.	1891
JACK, EDWIN L., 134 William St., Portland, Me.	1916
JACKSON, DR. HARTLEY H. T., Biological Survey, Washington, D. C.	1910
JACKSON, THOMAS H., 304 N. Franklin St., West Chester, Pa.	1888
JAMES, NORMAN, Catonsville, Md.	1913
JENKS, CHAS. W., Bedford, Mass.	1912
JENNEY, CHARLES F., 100 Gordon Ave., Hyde Park, Mass.	1905
JENNINGS, RICHARD D., 129 Harrison St., East Orange, N. J.	1913
JENSEN, J. K., U. S. Indian School, Santa Fé, N. Mex.	1912
JEWETT, STANLEY G., Pendleton, Ore.	1906
JOHNSON, FRANK E., 16 Amackassin Terrace, Yonkers, N. Y.	1888
JOHNSON, MRS. GRACE PETTIS, City Library Asso., Springfield, Mass.	1908
JOHNSON, JULIUS M., 77 Herkimer St., Brooklyn, N. Y.	1913
JOHNSON, WILBUR WALLACE, 144 Harrison St., East Orange, N. J.	1914
JONES, DR. LOMBARD CARTER, Falmouth, Mass.	1917
JONES, MRS. RUTH HARVEY, 1203 Ryland Ave., Cincinnati, Ohio.	1902
JORDAN, A. H. B., Lowell, Wash.	1888
JUMP, MRS. EDWIN R., 97 Oakleigh Road, Newton, Mass.	1910
JUNKIN, FRANCIS T. A., 2541 Michigan Ave., Chicago, Ill.	1917
KEYS, JAMES EDWARD, 328 St. George St., London, Ontario.	1899
KELLOGG, RALPH T., Silver City, N. M.	1913
KELSO, DR. JOHN E. H., Edgewood, Lower Arrow Lake, B. C.	1915
KENISTON, ALLAN, Edgartown, Mass.	1917
KENNEDY, DR. HARRIS, Readville, Mass.	1916
KENT, DUANE E., 47 West St., Rutland, Vt.	1913
KENT, EDWIN C., 156 Broadway, New York, N. Y.	1907
KERMODE, FRANCIS, Provincial Museum, Victoria, B. C.	1904
*KIDDER, NATHANIEL T., Milton, Mass.	1906
KILGORE, WILLIAM, JR., 132 Orlin Ave., S. E., Minneapolis, Minn.	1906
KINGSBURY, FREDERICK S., Needham, Mass.	1916
KING, LEROY, 20 E. 84th St., New York, N. Y.	1901
KIRKHAM, MRS. JAMES W., 275 Maple St., Springfield, Mass.	1904
*KIRKHAM, STANTON D., 152 Howell St., Canandaigua, N. Y.	1910
KIRKWOOD, FRANK C., R. F. D. 3, Monkton, Md.	1892
KITTREDGE, Lieut. JOSEPH, JR., Engineers, H. L. C., A. E. F., France	1910
KLOSEMAN, MISS JESSIE E., Beal Hall, 20 Charlesgate W., Boston, Mass.	1909
KNAEBEL, ERNEST, 3707 Morrison St., Chevy Chase, D. C.	1906
KNAPP, MRS. HENRY A., 301 Quincy Ave., Scranton, Pa.	1907
KNOLHOFF, FERDINAND WILLIAM, Amityville, N. Y.	1890
KRETZMAN, Prof. P. E., 1230 St. Anthony Ave., St. Paul, Minn.	1913

KUSER, ANTHONY R., Bernardsville, N. J.....	1908
KUSER, MRS. ANTHONY R., Bernardsville, N. J.....	1910
KUSER, JOHN DRYDEN, Bernardsville, N. J.....	1910
LACEY, HOWARD GEORGE, R. F. D. 1, Kerrville, Texas.....	1899
LADD, HARRY STEPHEN, 4354 McPherson Ave., St. Louis, Mo.....	1917
LADOW, STANLEY V., 622 W. 113th St., New York, N. Y.....	1913
LAING, HAMILTON M., 1277 E. 32nd St., Portland, Ore.....	1917
LAMB, CHAS. R., 8 Highland St., Cambridge, Mass.....	1912
LANCASHIRE, MRS. JAMES HENRY, 7 East 75th St., New York, N. Y..	1909
LANG, HERBERT, Amer. Mus. Nat. Hist., New York, N. Y.....	1907
LANTZ, Prof. DAVID E., 1443 Belmont St., Washington, D. C.....	1885
LATHAM, ROY, Orient, N. Y.....	1916
LAURENT, PHILIP, 31 E. Mt. Airy Ave., Philadelphia, Pa.....	1902
LAWSON, RALPH, 88 Washington Sq. East, Salem, Mass.....	1917
LEE, JOHN C., Grove St., Wellesley, Mass.....	1917
LEISTER, CLAUDE W., 113 Osmun Place, Ithaca, N. Y.....	1916
LENGERKE, JUSTUS VON, 200 5th Ave., New York, N. Y.....	1907
LEOPOLD, ALDO, 135 S. 14th St., Albuquerque, N. Mex.....	1916
LEOPOLD, NATHAN, JR., 4754 Greenwood Ave., Chicago, Ill.....	1916
LEVY, MRS. WILLIAM, Alton Bay, N. H.....	1915
LEWIS, Serg. Major HARRISON F., R. R. 2, Yarmouth, Nova Scotia.	1912
LEWIS, MRS. HERMAN E., 120 Grove St., Haverhill, Mass.....	1912
LIGON, J. STOKLEY, Box 131, Albuquerque, New Mexico.....	1912
LINCOLN, FREDERICK CHARLES, Colo. Mus. Nat. Hist., Denver, Colo.	1910
LINGS, GEO. H., Richmond Hill, Cheadle, Cheshire, England.....	1913
LITTLE, LUTHER 2d, 519 Stimson Bldg., Los Angeles, Cal.....	1913
LLOYD, HOYES, 11 Swanwick Ave., Toronto, Canada.....	1916
LORD, THOMAS HENRY, Newington, N. H.....	1916
LORING J. ALDEN, Owego, N. Y.....	1917
LOW, ETHELBERT T., 30 Broad St., New York, N. Y.....	1907
LUCE, MRS. FRANCIS P., Box 216, Vineyard Haven, Mass.....	1912
LUM, EDWARD H., Chatham, N. J.....	1904
LUND, EDWARD G., 529 Beacon St., Boston, Mass.....	1915
MABBOTT, DOUGLAS C., Biological Survey, Washington, D. C.....	1916
MACDONALD, Miss HAZEL, Kersey, Colo.....	1916
MACKIE, Dr. WILLIAM C., 54 Coolidge St., Brookline, Mass.....	1908
MACLAY, MARK W., Jr., 830 Park Ave., New York, N. Y.....	1905
MACREYNOLDS, GEORGE, Doylestown, Pa.....	1917
MADDOCK, Miss EMELINE, 6386 Drexel Road, Overbrook, Pa.....	1897
MADISON, HAROLD L., Park Museum, Providence, R. I.....	1912
MAHER, J. E., 351 Communipaw Ave., Jersey City, N. J.....	1902
MAIN, FRANK H., 227 N. 18th St., Philadelphia, Pa.....	1913
MAITLAND, ROBERT L., 141 Broadway, New York, N. Y.....	1889
MANN, ELIAS P., Williamstown, Mass.....	1912
MAPLES, JAMES C., Port Chester, N. Y.....	1913
MARBLE, RICHARD M., Woodstock, Vt.....	1907

MARKS, EDWARD SIDNEY, 655 Kearney Ave., Arlington, N. J.....	1915
MARRS, MRS. KINGSMILL, 9 Commonwealth Ave., Boston, Mass....	1903
MARSHALL, ALFRED, 17 S. Jefferson St., Chicago, Ill.....	1916
MARSHALL, ELLA M. O., New Salem, Mass.....	1912
MARTIN, MISS JANET, Milford, Conn.....	1916
MARX, Capt. EDWARD J. F., 207 Burke St., Easton, Pa.....	1907
MATHEWS, F. SCHUYLER, 17 Frost St., Cambridge, Mass.....	1917
MATTERN, EDWIN S., 1042 Walnut St., Allentown, Pa.....	1912
MATTERN, WALTER I., 1042 Walnut St., Allentown, Pa.....	1912
MAY, Dr. JOHN B., Cohasset, Mass.....	1916
MAYNARD, MRS. EDITH CLARK, Bryn Mawr, Pa.....	1916
McCLINTOCK, NORMAN, 504 Amberson Ave., Pittsburgh, Pa.....	1900
McCONNELL, THOMAS S., 1813 Huey St., McKeesport, Pa.....	1915
McCOOK, Major PHILIP J., 571 Park Ave., New York, N. Y.....	1895
McGRAW, HARRY A., 1805 15th Ave., Altoona, Pa.....	1917
McGREW, ALBERT D., 564 Stanton Ave., Pittsburgh, Pa.....	1917
McHATTON, T. H., 163 Mell St., Athens, Ga.....	1917
McILHENNY, EDWARD AVERY, Avery Island, La.....	1894
McINTIRE, MRS. HERBERT BRUCE, 4 Garden St., Cambridge, Mass..	1908
McLAIN, ROBERT BAIRD, Market and 12th St., Wheeling, W. Va....	1893
McLANE, JAMES LATIMER, Jr., Garrison, Md.....	1915
McLEAN, Hon. GEO. P., 1520 New Hampshire Ave., Washington, D. C.	1913
McMAHON, WALT F., 1974 Broadway, New York, N. Y.....	1913
McMILLAN, MRS. GILBERT N., Gorham, N. H.....	1902
MEAD, MRS. E. M., 303 W. 84th St., New York, N. Y.....	1904
MEANS, CHAS. J., 29 Marlborough St., Boston, Mass.....	1912
MENGEL, G. HENRY, 739 Madison Ave., Reading, Pa.....	1913
MERRIAM, HENRY F., R. F. D. 1, Newton, N. J.....	1905
MERRILL, ALBERT R., Hamilton, Mass.....	1912
MERRILL, D. E., State College, New Mexico.....	1913
MERRILL, HARRY, 316 State St., Bangor, Maine.....	1883
MERSHON, W. B., Saginaw, Mich.....	1905
METCALF, F. P., Biological Survey, Washington, D. C.....	1917
METCALF, Z. P., A. & M. College, West Raleigh, N. C.....	1913
MEYER, Capt. G. RALPH, C. D. of Oahu, Ft. Kanehameha, Hawaii..	1913
MEYER, Miss HELOISE, Lenox, Mass.....	1913
MILES, MRS. HENRY A., Hingham, Mass.....	1917
MILLER, Miss BERTHA STUART, Box 2, Palisade, N. J.....	1915
MILLER, CHAS. W., Jaffna College, Jaffna, Ceylon.....	1909
MILLER, MRS. ELISABETH C. T., 1010 Euclid Ave., Cleveland, Ohio..	1916
MILLS, ENOS A., Estes Park, Colo.....	1916
MINER, LEO D., 1836 Vernon St., N. W. Washington, D. C.....	1913
MITCHELL, CATHERINE ADAMS, Riverside, Ill.....	1911
MITCHELL, MASON, U. S. Consul, Apia, Samoa.....	1916
MITCHELL, Dr. WALTON I., 603 Beacon Bldg., Wichita, Kan.....	1893
MOODY, HARRY LEE, Glyndon, Minn.....	1916

MOORE, ELIZABETH PUTNAM, 5300 Media St., Philadelphia, Pa.....	1905
MOORE, RAYMOND W., Kensington, Md.....	1916
MORCOM, G. FREAN, 243 N. Coronado St., Los Angeles, Cal.....	1886
MORLEY, S. GRISWOLD, 2535 Etna St., Berkeley, Cal.....	1911
MORRISON, ALVA, 53 Middle St., Braintree, Mass.....	1915
MORSE, HARRY GILMAN, Huron, Ohio.....	1912
MOSHER, FRANKLIN H., 17 Highland Ave., Melrose Highlands, Mass.....	1905
MOULTON, J. SIDNEY, Stow, Mass.....	1917
MOUSLEY, WM. HENRY, Hatley, Quebec, Canada.....	1915
MUNRO, J. A., Okanagan Landing, British Columbia, Canada.....	1913
MUNSON, Prof. WILLIAM H., 317 Franklin St., Winona, Minn.....	1915
MURIE, O. J., 219 7th Ave. S, Moorhead, Minn.....	1913
MYERS, MRS. HARRIET W., 311 N. Ave. 66, Los Angeles, Cal.....	1906
MYERS, Miss LUCY F., 127 Academy St., Poughkeepsie, N. Y.....	1898
NEWBERRY, WALTER C., Winnemucca, Nev.....	1916
NEWELL, Mrs. H. S., 2431 E. 5th St., Duluth, Minn.....	1912
NICHOLS, L. NELSON, N. Y. Public Library, New York, N. Y.....	1917
NIMS, Mrs. LUCIUS, 17 Union St., Greenfield, Mass.....	1913
NOBLE, ELEANOR G., 66 Sparks St., Cambridge, Mass.....	1916
NOBLE, G. KINGSLEY, Mus. Comp. Zoölogy, Cambridge, Mass.....	1916
NOKES, Dr. I. D., 134 W. 55th St., Los Angeles, Cal.....	1915
NOLTE, Rev. FELIX, St. Benedict's College, Atchison, Kan.....	1903
NORRIS, EDWARD, 301 W. Springfield Ave., Philadelphia, Pa.....	1916
NORRIS, J. PARKER, Jr., 2122 Pine St., Philadelphia, Pa.....	1904
NORRIS, ROY C., General Delivery, Portland, Ore.....	1904
NOWELL, JOHN ROWLAND, 300 Parkwood Boulev., Schenectady, N. Y.....	1897
OGDEN, Dr. HENRY VINING, 141 Wisconsin St., Milwaukee, Wis.....	1897
OLDYS, HENRY, Silver Springs, Md.....	1896
*OLIVER, Dr. HENRY KEMBLE, 4 Newbury St., Boston, Mass.....	1900
ORDWAY, Miss ELIZABETH I., 20 Myrtle St., Winchester, Mass.....	1913
OSBORN, ARTHUR A., 58 Washington St., Peabody, Mass.....	1912
OTTEMILLER, FREE, 30 N. Pine St., York, Pa.....	1914
OVERTON, Dr. FRANK, Patchogue, N. Y.....	1909
*OWEN, Miss JULIETTE AMELIA, 306 N. 9th St., St. Joseph, Mo.....	1897
PACKARD, WINTHROP, 1442 Washington St., Canton, Mass.....	1917
PAINE, AUGUSTUS G., Jr., 18 West 49th St., New York, N. Y.....	1886
PAINE, CHARLES JACKSON, 705 Sears Bldg., Boston, Mass.....	1917
PALMER, Dr. SAMUEL C., Swarthmore College, Swarthmore, Pa.....	1899
PANGBURN, CLIFFORD H., 731 Elm St., New Haven, Conn.....	1907
PARKER, EDWARD LUDLOW, 50 State St., Boston, Mass.....	1916
PAUL, LUCIUS H., 1485 North St., Rochester, N. Y.....	1908
PAXTON, Mrs. REGINA A., 4728 13th St. N. W., Washington, D. C.....	1917
PEABODY, Rev. P. B., Independence, Ia.....	1903
PECK, MORTON E., 1458 Court St., Salem, Ore.....	1909

PENARD, THOS. E., 16 Norfolk Road, Arlington, Mass.....	1912
PENFIELD, MISS ANNIE L., 155 Charles St., Boston, Mass.....	1912
PEPPER, MAJOR WM., 1811 Spruce St., Philadelphia, Pa.....	1911
PERINE, KEBLE, 26 Trull St., Boston, Mass.....	1917
PERKINS, DR. ANNA E., So. Cal. State Hospital, Patton, Cal.....	1917
PERKINS, ARTHUR W., 21 High St., Farmington, Me.....	1915
PERKINS, DR. GEO. H., Univ. of Vt., Burlington, Vt.....	1912
PERRY, DR. HENRY JOSEPH, 1720 Beacon St., Boston, Mass.....	1909
PETERS, ALBERT S., Lake Wilson, Minn.....	1908
PETERS, LIEUT. JAMES LEE, Harvard, Mass.....	1904
PHELPS, FRANK M., 212 E. 4th St., Elyria, Ohio.....	1912
PHELPS, MRS. J. W., Box 36, Northfield, Mass.....	1899
PHILIPP, PHILIP B., 220 Broadway, New York, N. Y.....	1907
PHILLIPS, ALEXANDER H., 54 Hodge Road, Princeton, N. J.....	1891
PHILLIPS, CHAS. LINCOLN, 5 West Weir St., Taunton, Mass.....	1912
PILSBURY, FRANK O., 1088 Main St., Walpole, Mass.....	1917
PINCHOT, GIFFORD, 1617 Rhode Island Ave., Washington, D. C....	1910
PLATT, HON. EDMUND, Poughkeepsie, N. Y.....	1917
POE, MISS MARGARETTA, 1204 N. Charles St., Baltimore, Md.....	1899
POOLE, EARL L., School Admin. Bldg., Reading, Pa.....	1916
PORTER, MISS E., 75 St. James St. E., San José, Cal.....	1917
PORTER, LOUIS H., Stamford, Conn.....	1893
POST, WILLIAM S., Bernardsville, N. J.....	1911
POTTER, JULIAN K., 563 Bailey St., Camden, N. J.....	1912
POWELL, MRS. S. W., West Becket, Mass.....	1917
PRAEGER, WILLIAM E., 421 Douglas Ave., Kalamazoo, Mich.....	1892
PRATT, HON. GEO. D., State Conservation Commission, Albany, N. Y.	1917
PRICE, JOHN HENRY, Crown W Ranch, Knowlton, Mont.....	1906
PRICE, LIGON, R. F. D. 1, Dunmore, W. Va.....	1913
PROVO, W. F., Wickliffe, Ohio.....	1916
PURDY, JAMES B., R. F. D. 4, Plymouth, Mich.....	1893
QUIGGLE, JAMES C., 1410 M St., N. W., Washington, D. C.....	1915
RAMSDEN, CHAS. T., Box 146, Guantanamo, Cuba.....	1912
RAWSON, CHAS. I., Oxford, Mass.....	1917
REA, PAUL M., Charleston Museum, Charleston, S. C.....	1912
REAGH, DR. ARTHUR LINCOLN, 39 Maple St., West Roxbury, Mass.	1896
REDFIELD, MISS ELISA W., 248 Newbury St., Boston, Mass.....	1897
REGAR, H. SEVERN, 1400 De Kalb St., Norristown, Pa.....	1916
REHN, JAMES A. G., 6033 B Catherine St., Philadelphia, Pa.....	1901
REICHENBERGER, MRS. VICTOR M., Hotel Essex, New York, N. Y.	1916
RETT, EGMONT Z., 3902 Pecos St., Denver, Colo.....	1917
RHOADS, CHARLES J., National Reserve Bank, Philadelphia, Pa....	1895
RICE, WARD J., Roachdale, Ind.....	1913
RICHARDS, MISS HARRIET E., 36 Longwood Ave., Brookline, Mass.	1900
RICHARDSON, W. D., 4215 Prairie Ave., Chicago, Ill.....	1917
RIDDLE, ROBERT, 21 W. Rogers Ave., Merchantville, N. J.....	1916

RIDDLE, S. EARL, Y. M. C. A., Chester, Pa.....	1916
RIDGWAY, JOHN L., Chevy Chase, Md.....	1890
RIKER, CLARENCE B., 43 Scotland Road, South Orange, N. J.....	1885
ROBBEN, Miss NANCY P. H., 412 E. Merrimack St., Lowell, Mass..	1917
ROBBINS, CHARLES A., Onset, Mass.....	1914
ROBBINS, ROYAL E., 61 Monmouth St., Brookline, Mass.....	1917
ROBERTS, WILLIAM ELY, 207 McKinley Ave., Lansdowne, Pa.....	1902
ROBERTSON, HOWARD, 157 S. Wilton Drive, Los Angeles, Cal.....	1911
ROBINSON, ANTHONY W., Haverford, Pa.....	1903
*ROGERS, CHARLES H., Amer. Mus. Nat. Hist., New York, N. Y....	1904
ROLAND, CONRAD K., 1208 De Kalb St., Norristown, Pa.....	1917
ROOSEVELT, FRANKLIN DELANO, Hyde Park, N. Y.....	1896
ROSS, GEORGE H., 23 West St., Rutland, Vt.....	1904
ROSS, Dr. LUCRETIOUS H., 507 Main St., Bennington, Vt.....	1912
ROWLEY, JOHN, 42 Plaza Drive, Berkeley, Cal.....	1889
SACKETT, CLARENCE, Rye, N. Y.....	1910
SAGE, HENRY M., Menands Road, Albany, N. Y.....	1885
SANBORN, COLIN C., Box 50, Evanston, Ill.....	1911
SAUNDERS, ARETAS A., 143 East Ave., Norwalk, Conn.....	1907
SAVAGE, L. F., 1210 Jenny Lind St., McKeesport, Pa.....	1917
SAWYER, EDMUND J., Box 123, Watertown, N. Y.....	1915
SCHAEFER, OSCAR FREDERICK, 66 Genesee St., Rochester, N. Y....	1916
SCHENCK, FREDERIC, 8 Gloucester St., Boston, Mass.....	1912
SCHORGER, A. W., 2021 Kendall Ave., Madison, Wis.....	1913
SCOVILLE, SAMUEL, JR., 1308 Pennsylvania Bldg., Philadelphia, Pa.	1916
SCUDDER, BRADFORD A., 457 W. 164th St., New York, N. Y.....	1917
SEARS, WILLIAM R., 73 Tremont St., Boston, Mass.....	1916
SERRILL, WILLIAM J., Haverford, Pa.....	1916
SHARPLES, ROBERT P., West Chester, Pa.....	1907
SHAW, HENRY S., 78 Cypress St., Newton Centre, Mass.....	1916
SHAW, WILLIAM T., 900 Campus Ave., Pullman, Wash.....	1908
SHEA, DANIEL W., Catholic Univ. of Amer., Washington, D. C....	1917
SHEARER, Dr. AMON R., Mont Belvieu, Tex.....	1905
SHELDON, CHARLES, Woodstock, Vt.....	1911
SHELTON, ALFRED, Univ. of Oregon, Eugene, Ore.....	1911
SHERMAN, HARLEY B., 620 Church St., Ann Arbor, Mich.....	1916
SHIRLEY, GARLAND L., Dayton, Va.....	1916
SHOEMAKER, CLARENCE R., 3116 P St., Washington, D. C.....	1910
SHOEMAKER, HENRY, 71 Broadway, New York, N. Y.....	1912
SHOFFNER, CHARLES P., 1345 Arch St., Philadelphia, Pa.....	1915
SHROSBREE, GEORGE, Public Museum, Milwaukee, Wis.....	1899
SILLMAN, O. P., Salinas, Cal.....	1915
SILSBEE, THOMAS, 115 Marlborough St., Boston, Mass.....	1916
SIMMONS, GEO. FINLAY, Rice Institute, Houston, Texas.....	1910

SKINNER, M. P., Yellowstone Park, Wyoming.....	1916
SMITH, AUSTIN PAUL, 2102 E. 83d St., Cleveland, Ohio.....	1911
SMITH, Rev. FRANCIS CURTIS, 812 Columbia St., Utica, N. Y.....	1903
SMITH, Prof. FRANK, 913 West California Ave., Urbana, Ill.....	1909
SMITH, HORACE G., State Museum, State House, Denver, Colo.....	1888
SMITH, LESTER W., 60 Cottage St., Meriden, Conn.....	1916
SMITH, LOUIS IRVIN, Jr., 3908 Chestnut St., Philadelphia, Pa.....	1901
SMITH, NAPIER, 46 Côtés des Neiges Road, Montreal, Canada.....	1915
SMITH, Mrs. WALLIS C., 525 N. Michigan Ave., Saginaw, W. S., Mich.....	1916
SMYTH, Prof. ELLISON A., Jr., Polytechnic Inst., Blacksburg, Va.....	1892
SNYDER, WILL EDWIN, 309 De Clark St., Beaver Dam, Wis.....	1895
SOULE, CAROLINE GRAY, 187 Walnut St., Brookline, Mass.....	1917
SPELMAN, HENRY M., 48 Brewster St., Cambridge, Mass.....	1911
SPENCER, Miss CLEMENTINA S., Dept. of Zoölogy, Coe College, Cedar Rapids, Iowa.....	1917
SQUIER, THEO. L., 149 Freemont St., Battle Creek, Mich.....	1915
STANWOOD, Miss CORDELIA JOHNSON, Ellsworth, Me.....	1909
STAPLETON, RICHARD, 219 High St., Holyoke, Mass.....	1916
STEELE, HENRY B., 4530 Drexel Boulevard, Chicago, Ill.....	1917
STEPHENS, T. C., Morningside College, Sioux City, Iowa.....	1909
STEVENS, Dr. J. F., Box 1546, Lincoln, Neb.....	1908
STEWART, Mrs. CECIL, 451 Beacon St., Boston, Mass.....	1917
STEWART, PHILLIP B., 1228 Wood Ave., Colorado Springs, Colo.....	1915
STILES, EDGAR C., 345 Main St., West Haven, Conn.....	1907
STODDARD, HERBERT LEE, Field Museum Nat. Hist., Chicago, Ill.....	1912
STORER, TRACY IRVIN, Mus. Vert. Zoölogy, Berkeley, Cal.....	1916
STRAW, Mrs. HERMAN F., 607 Chestnut St., Manchester, N. H.....	1916
STREET, J. FLETCHER, Beverly, N. J.....	1908
STUART, FRANK A., 118 Green St., Marshall, Mich.....	1915
STUART, GEO. H., 3rd, 923 Clinton St., Philadelphia, Pa.....	1913
STURGIS, S. WARREN, Groton, Mass.....	1910
STURTEVANT, EDWARD, St. George's School, Newport, R. I.....	1896
SUGDEN, ARTHUR W., 52 Highland St., Hartford, Conn.....	1913
SWAIN, JOHN MERTON, Box 528, Farmington, Me.....	1899
SWEENEY, J. A., Forest Service, Halsey, Neb.....	1916
SWENK, MYRON H., 3028 Starr St., Lincoln, Neb.....	1904
TATNALL, SAMUEL A., 503 Hansberry St., Philadelphia, Pa.....	1916
TAYLOR, ALEXANDER R., 1410 Washington St., Columbia, S. C.....	1907
TAYLOR, HORACE, 93 Binney St., Roxbury, Mass.....	1917
TAYLOR, LIONEL E., Bankhead, Kelowna, B. C.....	1913
TAYLOR, Dr. WALTER P., 1428 Perry Place, N. W., Washington, D. C.....	1916
TAYLOR, WARNER, 419 Sterling Court, Madison, Wis.....	1916
TERRILL, LEWIS McI., 44 Stanley Ave., St. Lambert, Quebec.....	1907
THOMAS, Miss EMILY HINDS, Bryn Mawr, Pa.....	1901
THOMPSON, J. WALCOTT, 527 East First South St., Salt Lake City, Utah.....	1916

THORNE, GERALD, 334 N. 5 E. St., Logan, Utah.....	1917
THORNS, Miss JULIA A., Asheboro, N. C.....	1916
TINKER, ALMERIN D., 631 S. 12th St., Ann Arbor, Mich.....	1907
TOWER, Mrs. KATE DENIG, 9 Newbury St., Boston, Mass.....	1908
TOWNSHEND, HENRY HOTCHKISS, 69 Church St., New Haven, Conn.....	1915
TREGANZA, A. O., 614 E. South St., Salt Lake City, Utah.....	1906
TROTTER, WILLIAM HENRY, 36 N. Front St., Philadelphia, Pa.....	1899
TRULL, HARRY S., 317 East 196th St., New York, N. Y.....	1917
TRUMBELL, J. H., Plainville, Conn.....	1907
TUDBURY, WARREN C., 9 Oxford St., Chevy Chase, Md.....	1903
TWEEDY, EDGAR, 27 Fairview Ave., Danbury, Conn.....	1902
TYLER, JOHN G., 219 Glenn Ave., Fresno, Cal.....	1912
UNDERWOOD, Wm. LYMAN, Mass. Inst. of Tech., Cambridge, Mass.....	1900
VALENTINE, Miss ANNA J., Bellefonte, Pa.....	1905
VAN CORTLANDT, Miss ANNE S., Croton-on-Hudson, N. Y.....	1885
VAN NAME, WILLARD G., Am. Mus. Nat. History, New York, N. Y.....	1900
VETTER, Dr. CHARLES, 2 West 88th St., New York, N. Y.....	1898
VIERECK, HENRY L., Biological Survey, Washington, D. C.....	1916
VIETOR, Mrs. EDWARD W., 166 St. James Place, Brooklyn, N. Y.....	1914
VISHER, Dr. STEPHEN S., State Normal, Moorhead, Minn.....	1904
WADSWORTH, CLARENCE S., 27 Washington St., Middletown, Conn.....	1906
WALKER, GEO. R., R. D. 3, Murray, Utah.....	1909
WALLACE, CHAS. R., 69 Columbus Ave., Delaware, Ohio.....	1913
WALLACE, JAMES S., 12 Wellington St., E., Toronto, Ontario.....	1907
WALTER, Dr. HERBERT E., 67 Oriole Ave., Providence, R. I.....	1901
WALTERS, FRANK, 125 23rd St., Elmhurst, N. Y.....	1902
WARBURTON, STANTON, Jr., 1221 N. Fife St., Tacoma, Wash.....	1917
WARD, FRANK H., 18 Grove Place, Rochester, N. Y.....	1908
WARD, HENRY L., 520 Lake Drive, Milwaukee, Wis.....	1906
WARD, ROY A., Biological Survey, Washington, D. C.....	1915
WARNER, EDWARD P., Mass. Inst. of Technology, Cambridge, Mass.....	1910
WATSON, Mrs. ALEX M., 124 Hatton St., Portsmouth, Va.....	1910
WATSON, JAMES D., 6042 Harper Ave., Chicago, Ill.....	1917
WEBER, J. A., Palisades Park, N. J.....	1907
WEBSTER, Dr. GEORGE A., 419 Boylston St., Boston, Mass.....	1916
WEBSTER, Mrs. JENNIE E. B., 44 East 23rd St., New York, N. Y.....	1917
WEISEMAN, T. WALTER, 226 Beaver Road, Emsworth, Pa.....	1916
WEISER, CHARLES S., 105 W. Springettsbury Ave., York, Pa.....	1916
WELLMAN, GORDON B., 54 W. Beltran St., Malden, Mass.....	1908
WETMORE, Mrs. EDMUND H., 125 E. 57th St., New York, N. Y.....	1902
WEYGANDT, Dr. CORNELIUS, 6635 Wissahickon Ave., Philadelphia, Pa.....	1907
WHALER, Mrs. J. W., 14 Murry Place, Princeton, N. J.....	1916
WHARTON, WILLIAM P., Groton, Mass.....	1907
WHEELER, JOHN B., East Templeton, Mass.....	1917
WHITE, FRANCIS BEACH, St. Paul's School, Concord, N. H.....	1891
WHITE, GEORGE R., Dead Letter Office, Ottawa, Canada.....	1903

WHITE, W. A., 14 Wall St., New York, N. Y.....	1902
WHITTLE, CHARLES L., 20 Langdon St., Cambridge, Mass.....	1916
WIEGMANN, DR. WILLIAM HENRY, 436 East 5th St., New York, N. Y....	1916
WILBUR, ADDISON P., 60 Gibson St., Canandaigua, N. Y.....	1895
WILCOX, T. FERDINAND, 118 E. 54th St., New York, N. Y.....	1895
WILEY, LEO, Palo Verde, Cal.....	1917
WILLARD, BERTEL G., 1619 Massachusetts Ave., Cambridge, Mass....	1906
WILLARD, FRANK C., Farmingdale, N. Y.....	1909
WILLCOX, Prof. M. A., 63 Oakwood Road, Newtonville, Mass.....	1913
WILLIAMS, Miss BELLE, Colonia Hotel, Columbia, S. C.....	1915
WILLIAMS, ROBERT S., N. Y. Botanical Gardens, New York, N. Y....	1888
WILLIAMS, ROBERT W., U. S. Dept. Agric., Washington, D. C.....	1900
WILLIAMSON, E. B., Bluffton, Ind.....	1900
WILLIS, Miss CLARA L., 91 Wyman St., Waban, Mass.....	1915
WILLISTON, Mrs. SAMUEL, 577 Belmont St., Belmont, Mass.....	1911
WILMOT, NELSON E., 24 New St., West Haven, Conn.....	1916
WILSON, Mrs. E. S., 2 Clarendon Ave., Detroit, Mich.....	1917
WING, DeWITT C., 5344 Dorchester Ave., Chicago, Ill.....	1913
WINSLOW, ARTHUR M., Jackson, Mich.....	1912
WISE, Miss HELEN D., 1514 13th St., N. W., Washington, D. C....	1916
WITTER, Mrs. HENRY M., 12 Montague St., Worcester, Mass.....	1916
WOLFE, PATRICK R., 1129 Tinton Ave., New York, N. Y.....	1917
WOOD, Dr. CASEY A., 7 W. Madison St., Chicago, Ill.....	1917
WOOD, GEORGE B., 129 S. 18th St., Philadelphia, Pa.....	1916
WOOD, Mrs. N. P., Northfield, Mass.....	1917
WOOD, NELSON R., Smithsonian Institution, Washington, D. C....	1895
WOODRUFF, FRANK M., Acad. of Sciences, Lincoln Park, Chicago, Ill..	1894
WOODRUFF, LEWIS B., 14 E. 68th St., New York, N. Y.....	1886
WOODWARD, Dr. LEMUEL, 52 Pearl St., Worcester, Mass.....	1917
WORCESTER, Mrs. ALFRED J., 314 Bacon St., Waltham, Mass.....	1908
WRIGHT, ALBERT H., Cayuga Heights, Ithaca, N. Y.....	1906
WRIGHT, FRANK S., 14 Cayuga St., Auburn, N. Y.....	1917
WRIGHT, Miss HARRIET H., 1637 Gratiot Ave., Saginaw, W. S., Mich.	1907
WRIGHT, HORACE WINSLOW, 107 Pinckney St., Boston, Mass.....	1902
WYMAN, LUTHER E., 3927 Wisconsin St., Los Angeles, Cal.....	1907
YOUNG, JOHN P., 1510 5th Ave., Youngstown, Ohio.....	1911
ZIMMER, J. T., Dept. of Agriculture, Port Moresby, British Papua...	1908

DECEASED MEMBERS.

FELLOWS.

	<i>Date of Death</i>
ALDRICH, CHARLES.....	March 8, 1908
BAIRD, SPENCER FULLERTON.....	Aug. 19, 1887
BEAL, FOSTER ELLENBOROUGH LASCELLES.....	Oct. 1, 1916
BENDIRE, CHARLES EMIL.....	Feb. 4, 1897
COOKE, WELLS WOODBRIDGE.....	March 30, 1916
COUES, ELLIOTT*.....	Dec. 25, 1899
ELLIOT, DANIEL GIRAUD*.....	Dec. 22, 1915
GOSS, NATHANIEL STICKNEY.....	March 10, 1891
HOLDER, JOSEPH BASSETT.....	Feb. 28, 1888
JEFFRIES, JOHN AMORY.....	March 26, 1892
McILWRAITH, THOMAS.....	Jan. 31, 1903
MEARNS, EDGAR ALEXANDER.....	Nov. 1, 1916
MERRILL, JAMES CUSHING.....	Oct. 27, 1902
PURDIE, HENRY AUGUSTUS.....	March 29, 1911
SENNETT, GEORGE BURRITT.....	March 18, 1900
TRUMBULL, GURDON.....	Dec. 28, 1903
WHEATON, JOHN MAYNARD.....	Jan. 28, 1887

RETIRED FELLOWS.

BELDING, LYMAN.....	Nov. 22, 1917
GILL, THEODORE NICHOLAS.....	Sept. 25, 1914

HONORARY FELLOWS.

BLANFORD, WILLIAM THOMAS.....	June 23, 1905
BARBOZA DU BOCAGE, JOSÉ VICENTE.....	July —, 1908
BERLEPSCH, HANS VON.....	Feb. 27, 1915
BURMEISTER, KARL HERMANN KONRAD.....	May 1, 1891
CABANIS, JEAN LOUIS.....	Feb. 20, 1906
DRESSER, HENRY EELES.....	Nov. 28, 1915
GÄTKE, HEINRICH.....	Jan. 1, 1897
GIGLIOLI, ENRICO HILLYER.....	Dec. 16, 1909
GUNDLACH, JOHANNES CHRISTOPHER.....	March 17, 1896
GURNEY, JOHN HENRY.....	April 20, 1890
HARTLAUB, [KARL JOHANN] GUSTAV.....	Nov. 20, 1900

* Presidents of A. O. U.

HARVIE-BROWN, JOHN ALEXANDER.....	July 26, 1916
HUME, ALLAN OCTAVIAN.....	July 31, 1912
HUXLEY, THOMAS HENRY.....	June 29, 1895
KRAUS, FERDINAND.....	Sept. 15, 1890
LAWRENCE, GEORGE NEWBOLD.....	Jan. 17, 1895
MEYER, ADOLF BERNHARD.....	Feb. 5, 1911
MILNE-EDWARDS, ALPHONSE.....	April 21, 1900
NEWTON, ALFRED.....	June 7, 1907
PARKER, WILLIAM KITCHEN.....	July 3, 1890
PELZELN, AUGUST VON.....	Sept. 2, 1891
SALVIN, OSBERT.....	June 1, 1898
SAUNDERS, HOWARD.....	Oct. 20, 1907
SCHLEGEL, HERMANN.....	Jan. 17, 1884
SCLATER, PHILIP LUTLEY.....	June 27, 1913
SEEBOHM, HENRY.....	Nov. 26, 1895
SHARPE, RICHARD BOWDLER.....	Dec. 25, 1909
TACZANOWSKI, LADISLAS [CASIMIROVICH].....	Jan. 17, 1890
WALLACE, ALFRED RUSSELL.....	Nov. 7, 1913

CORRESPONDING FELLOWS.

ALTUM, JOHANN BERNARD THEODOR.....	Feb. 1, 1900
ANDERSON, JOHN.....	Aug. 15, 1900
BALDAMUS, AUGUSTE KARL EDUARD.....	Oct. 30, 1893
BLAKISTON, THOMAS WRIGHT.....	Oct. 15, 1891
BLASIUS, [PAUL HEINRICH] RUDOLPH.....	Sept. 21, 1907
BLASIUS, WILHELM AUGUST HEINRICH.....	May 31, 1912
BOGDANOW, MODEST NIKOLAEVICH.....	March 16, 1888
BROOKS, WILLIAM EDWIN.....	Jan. 18, 1899
BRYANT, WALTER [PIERC]E.....	May 21, 1905
BULLER, WALTER LAWRY.....	July 19, 1906
BUTLER, EDWARD ARTHUR.....	April 16, 1916
COLLETT, ROBERT.....	Jan. 27, 1913
COOPER, JAMES GRAHAM.....	July 19, 1902
CORDEAUX, JOHN.....	Aug. 1, 1899
DAVID, ARMAND.....	Nov. 10, 1900
DUGÈS, ALFRED.....	Jan. 7, 1910
FATIO, VICTOR.....	March 19, 1906
GIRTANNER, GEORG ALBERT.....	June 4, 1907
GOELDI, EMIL AUGUST.....	July 5, 1917
HAAST, JOHANN FRANZ JULIUS VON.....	Aug. 16, 1887
HARGITT, EDWARD.....	March 19, 1895
HAYEK, GUSTAV EDLER VON.....	Jan. 9, 1911
HERMAN, OTTO.....	Dec. 27, 1914

HOLUB, EMIL.....	Feb. 21, 1902
HOMEYER, EUGEN FERDINAND VON.....	May 31, 1889
KNUDSEN, VALDEMAR.....	Jan. 8, 1898
KRUKENBERG, CARL FRIEDRICH WILHELM.....	Feb. 18, 1889
LAYARD, EDGAR LEOPOLD.....	Jan. 1, 1900
LEVERKÜHN, PAUL.....	Dec. 5, 1905
LILFORD, LORD (THOMAS LITTLETON POWYS).....	June 17, 1896
MALMGREN, ANDERS JOHAN.....	April 12, 1897
MARSCHALL, AUGUST FRIEDRICH.....	Oct. 11, 1887
MIDDENDORFF, ALEXANDER THEODOROVICH.....	Jan. 28, 1894
MOSJISOVICS VON MOJSVAR, FELIX GEORG HERMANN AUGUST.....	Aug. 27, 1897
NORTH, ALFRED JOHN.....	May 6, 1917
OATES, EUGENE WILLIAM.....	Nov. 16, 1911
OUSTALET, [JEAN FRÉDÉRIC] ÉMILE.....	Oct. 23, 1905
PHILIPPI, RUDOLF AMANDUS.....	July 23, 1904
PRJEVALSKY, NICOLAS MICHAELOVICH.....	Nov. 1, 1888
PRENTISS, DANIEL WEBSTER.....	Nov. 19, 1899
PRYER, HARRY JAMES STOVIN.....	Feb. 17, 1888
RADDE, GUSTAV FERDINAND RICHARD VON.....	March 15, 1903
RAMSAY, EDWARD PIERSON.....	Dec. 16, 1916
SCHRENCK, LEOPOLD VON.....	Jan. 20, 1894
SÉLYS-LONGCHAMPS, MICHEL EDMOND DE.....	Dec. 11, 1900
SEVERTZOW, NICOLAS ALEKSYEVICH.....	Feb. 8, 1885
SHELLEY, GEORGE ERNEST.....	Nov. 29, 1910
STEVENSON, HENRY.....	Aug. 18, 1888
TRISTRAM, HENRY BAKER.....	March 8, 1906
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WOODHOUSE, SAMUEL WASHINGTON.....	Oct. 23, 1904

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BAGG, EGBERT.....	July 12, 1915
BROWN, HERBERT.....	May 12, 1913
CAMERON, EWEN SOMERLED.....	May 25, 1915
FANNIN, JOHN.....	June 20, 1904
HARDY, MANLY.....	Dec. 9, 1910
JUDD, SYLVESTER DWIGHT.....	Oct. 22, 1905
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PENNOCK, CHARLES JOHN (disappeared).....	May 15, 1913
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ADAMS, CHARLES FRANCIS.....	May 20, 1893
ALLEN, CHARLES SLOVER.....	Oct. 15, 1893
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Edgar A. Mearns

THE AUK:

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JANUARY, 1918.

No. 1.

IN MEMORIAM: EDGAR ALEXANDER MEARNS.

Born, September 11, 1856 — Died, November 1, 1916.

BY CHARLES W. RICHMOND.

Plate I.

IN the death of Dr. Mearns the American Ornithologists' Union has lost one of its Founders and most active members, and ornithology one of its most enthusiastic disciples. Friendly and genial in disposition, with an all-consuming interest in the study of nature, he craved the society of men of similar tastes, and looked forward with keen anticipation to the rare occasions when he was permitted to attend the annual sessions of the Union. As an army surgeon, he was subject to the vicissitudes and uncertainties of that calling, and during the greater part of his twenty-six years of active military service was far removed from museums and libraries, both indispensable adjuncts to the working naturalist. While this circumstance greatly interfered with his systematic studies, and prevented him from publishing any extended results of his discoveries, which he was well equipped by training and experience to perform, it undoubtedly contributed largely to his development as a field naturalist, in which field he was without an equal in this country, and enabled him to amass collections that are probably unrivalled as the efforts of a single individual. His activities of over forty years covered a wide range, of which but little, aside

from his ornithological achievements, can receive mention in the present notice.¹

Edgar Alexander Mearns, son of Alexander and Nancy Reliance (Carswell) Mearns, was born at the home of his grandfather (Alexander Mearns), at Highland Falls, near West Point, N. Y., September 11, 1856. His grandfather, born a few miles from Aberdeen, Scotland, in 1786, came to New York in 1805, after making several perilous voyages at sea. He settled at Highland Falls about the year 1815, where Alexander, his son, one of seven children, was born in 1823. Dr. Mearns' father died in 1873, but his mother, who comes of New England stock, is still living.

Edgar Mearns manifested a remarkable interest in birds and animals at a very early age, and this taste was fostered by his father, who bought him a large illustrated book on the native birds. He took great pleasure in looking at the pictures — he was only three years old at this time — and his mother spent hours in teaching him their names and histories, and he soon developed a wonderful knowledge of the subject for one of his years. As he grew older, his father gave him a gun, and they would shoulder their arms and wander through the fields together, close companions. He was taught to set box traps in these early years, and if there was no one at hand to go with him to inspect them, he would steal out alone to see what the traps contained. As a school boy he was often tardy as a result of lingering in the woods in search of specimens. Every natural object interested and attracted him.

Young Mearns was educated at Donald Highland Institute, at Highland Falls, and subsequently entered the College of Physicians and Surgeons of New York, from which he graduated in 1881. At the outset of his medical course, he became personally acquainted with several of the young naturalists of the time, E. P. Bicknell, A. K. Fisher, C. Hart Merriam, and others, some of whom were attending the same routine of studies. He and Dr. Fisher chanced to share the same room at a boarding house at this time, and it was here that the budding young Linnæan Society held its early meetings.

¹ The War Department was asked for a copy of Dr. Mearns' military record, but the request was refused, owing to the great amount of extra work now placed on the department.

When he was about ten years old he began to write out and preserve his observations on birds, and some of these, written in a very youthful hand, are still extant; but it was not until 1872, when a boy of sixteen, that his efforts had crystallized into a plan to prepare a report on the vertebrate fauna of his region, and he set to work with all the energy and enthusiasm of youth to gather material and information for this purpose. It was in the spring of this year that he seriously began a collection, and he then formed the habit of carefully labelling his specimens, noting any important items connected with each object, such as its dimensions in the flesh, the color of its eyes, and other facts of interest. This habit was faithfully followed in after years, and in birds alone it is estimated that over 60,000 measurements were recorded in his various field catalogues. He did not confine his attentions to zoölogy, but devoted himself to the flora as well, and unlike many young students he was ambitious to learn something of foreign species, for as early as 1875 he was in correspondence with one or more European collectors, from whom he obtained many specimens in exchange.

His first published paper, on 'The Capture of several Rare Birds near West Point, N. Y.,'¹ appeared in January, 1878, and it is worthy of comment that under the first species mentioned in this paper he acknowledged some information received from his "friend, Mr. Theodore Roosevelt," inasmuch as almost the last field work he ever undertook was with this same leader of men.

Three other notes followed shortly, while a paper on 'The White-headed Eagles in the Hudson Highlands,'² presented at the meeting of the Linnæan Society of New York, on April 6, 1878, was the first communication read before that newly formed society, and was appropriately published on July 4th. Toward the end of the year he had made sufficient progress with his big undertaking to look forward to a suitable medium of publication, and he wrote to Dr. J. A. Allen for advice. This letter, a copy of which was found among his manuscripts, is here reproduced, as it emphasizes the importance he attached to specific, as opposed to vague general

¹ Bull. Nuttall Orn. Club, III, No. 1, Jan., 1878, 45, 46.

² Forest and Stream, X, No. 111, July 4, 1878, 421; No. 113, July 18, 1878, 462, 463.

records, and illustrates the serious and painstaking method with which he handled his subject, a method of precision that he adhered to throughout his scientific work.

“117 W. 22nd St., N. Y.

Nov. 17, 1878.

Mr. J. A. Allen,

Dear Sir!

I have wanted to ask you several questions with regard to publishing a list of the Bds. of the Hudson River, and take the present opportunity to do so. Singularly enough, there is no medium of publication for such an article in this State. The “New York Academy” has recently changed very much in its character, and Mr. Geo. N. Lawrence tells me it would be impossible to get them to publish any lengthy paper on zoölogy, as he has much difficulty in getting them to take even brief articles of his own.

I am writing quite a bulky list of the Hudson Valley Bds., with which I am taking the greatest pains; particularly regarding dates of migration, breeding, life-habits, etc.

One of the more important points is the northern extension of the “*Carolinian Fauna*” up the Hudson.

I think the whole number of species that have been *taken* in the Hudson Valley (none others will be included), will amount to about 215.

I have been compiling the data of this list for several years. And now my object in writing to you, is to enquire whether there are any available facilities for getting the list published during the coming winter or spring. Would the “Boston Society Natural Hist.,” or “Bulletin Essex Institute” do it? If you will be kind enough to advise me I shall be extremely grateful.

I have tabulated all of the specimens I have taken (1800) in Hudson region, and have formulated tables of *measurements* of all of the specimens taken. I think that these tables contain matter of sufficient interest and importance to warrant publication, in the case of the rarer species especially. As time progresses, we all know that very considerable changes take place, respecting the geog. distribution of the Bds. Very many ornithologists of the present day receive with incredulity many statements of the old

naturalists, which *may* be worthy of perfect credence. Now, if De Kay and Giraud, who are about our only N. Y. State authorities had made *specific* instead of *general* statements regarding such species as *Euspiza Americana*, *Lophophanes bicolor*, *Thryothorus ludovicianus*, *Parus Carolinensis* and *Corvus ossifragus*, their observations would be of the greatest value; but many persons now doubt the accuracy of these observations. I think the tables of specimens captured and their measurements would be useful in this way if in no other. However I am quite willing to be advised in this matter."

This paper, 'A List of the Birds of the Hudson Highlands, with annotations,' was begun shortly in the 'Bulletin of the Essex Institute,'¹ seven installments appearing between 1879 and 1881, with an 'Addendum' issued in 'The Auk,' in 1890. As printed, it lacks the tables of measurements, these having been reduced to a simple statement of the average dimensions of each species. Dr. Allen, in reviewing the first four parts, said: "... His own notes, even when relating to some of our best known birds, are replete with new information attractively presented, few lists having appeared which offer so much that is really a contribution to the subject in a field where so little really new is to be looked for." In announcing later parts, the same reviewer wrote: "The high praise accorded the earlier installments is equally merited by those now under notice, Mr. Mearns's 'List of the Birds of the Hudson Highlands' ranking easily among the best of our long list of contributions to local ornithology. There is much said about the habits of various species that is entertaining or new..." Dr. Mearns intended this paper as the beginning of a complete catalogue of the vertebrates of the region, but his entrance into the Army, in 1883, caused the abandonment of this plan, although he later (1898) published part of his data on the remaining subjects in a paper entitled "A Study of the Vertebrate Fauna of the Hudson Highlands, with observations on the Mollusca, Crustacea, Lepidoptera, and the Flora of the Region."²

After completing his medical course, in 1881, he married Miss

¹ Bull. Essex Inst., X, 1878 (1879), 166-179; XI, 1879, 43-52; XI, 1879, 154-168; XI, 1880, 189-204; XII, 1880, 11-25; XII, 1881, 109-128; XIII, 1881, 75-93.

² Bull. Amer. Mus. Nat. Hist., X, 1898, 303-352.

Ella Wittich, of Circleville, Ohio, who shared his love of natural history, especially botany, and gave him considerable assistance with his collections. They had two children, a son, Louis di Zerega Mearns, and a daughter, Lillian Hathaway Mearns.

In 1882, Dr. Mearns took an examination for entrance into the medical department of the army; but the events of that period are best told in the following extract from a letter he afterwards wrote (March 16, 1885) to his old preceptor, Robert Donald, then at Lanesboro, Minn.:

"I informed you I think of my determination, you know it had long been my wish, to enter the army, of my coming up before the Army Medical Examining Board and of my passing satisfactorily the examination. I did not receive my commission at once but spent the summer in settling up our business affairs and in preparing to go to New York for the winter.

I stored my collection of specimens at the American Museum of Natural History, N. Y., and on the first of October was called there as temporary curator of Ornithology, and spent the winter. While there I labelled *all* of their large collection of *European* birds, and many others from Asia and Africa, and got up catalogues of all the ornithological and oölogical specimens in manuscripts with printed headings for all items of desirable data concerning the specimens. The most important thing that I accomplished there was the establishment of a cabinet collection in vertebrate zoölogy for the use of students." Confirmation of this last statement is found in a recent work,¹ where it is stated that "the first material for study collections was given by Dr. E. A. Mearns in 1882, consisting of skins and eggs of North American and European birds."

Dr. Mearns participated in the organization of the American Ornithologists' Union in September, 1883, and on Dec. 3 of that year received his commission as assistant surgeon in the army, with the rank of first lieutenant. He was offered a choice of several stations, and selected that of Fort Verde, in central Arizona, as promising an exceptional field for natural history investigations. He was accordingly assigned to this post, which he reached early in 1884. Fort Verde, abandoned as a military station in 1891, was then a

¹The Amer. Mus. Nat. Hist., its History, etc., 2d ed., 1911, 67.

desolate, arid place, but to Mearns it represented a new world, peopled with strange animals and plants, all worthy of the closest study. Within sight of the fort were ancient cliff dwellings, silent reminders of a vanished race; and San Francisco Mountain, then practically unexplored, was also visible in the distance. He set to work with his customary vigor, devoting all of his leisure time to the formation of a splendid collection of the animals and plants of this section of Arizona. The ruins in the neighborhood were also examined in considerable detail, excavations were made, and thousands of relics rescued from oblivion. He wrote a delightful and extremely interesting account of these explorations, under the title 'Ancient Dwellings of the Rio Verde Valley,' which appeared in 'Popular Science Monthly,' for October, 1890.

During the nearly four years he was stationed at this Arizona post, he was attached to various expeditions, some of them peaceful ones, others sent in pursuit of renegade Indians. In the letter to Mr. Donald, quoted above, he wrote: "We reached Fort Verde on March 25th, 1884, and, by a curious coincidence I am just in receipt of orders to leave on that day this year as surgeon in charge of the two cavalry regiments that are about to exchange stations between this department and Texas. I will have two acting Ass't Surgeons with me, which will make my duties light, and on the 900 miles of horseback riding that I will have, there will be much leisure and opportunity for zoölogical and botanical work. I was given the first choice to go on this expedition, and gladly accepted for the sake of the information which I expect to acquire of the fauna and flora of the southern part of Arizona and New Mexico. The medical director is personally friendly towards me and General Crook who commands the Department is particularly interested in my pursuits, and has chosen me to accompany him on two long expeditions through the wildest and least known portions of Arizona. On each of these trips an entire month was spent in the saddle, and a large collection of several hundred specimens of vertebrate animals was made, which were transported together with the rest of our plunder upon pack mules in panniers." The contemplated trip was duly performed, and a long account of it was recorded in one of his manuscript journals.

Dr. Mearns was popular with his brother officers, who marvelled

at his diligence and untiring zeal in the preparation of specimens, and many of them brought him trophies of various kinds as contributions to his collections. These cordial relations with his official associates continued throughout his career; indeed, his earnest and trustful nature and genuinely frank and straightforward character permitted no other course.

Early in 1888, he was transferred to Fort Snelling, Minn., where he remained until 1891, returning to this post again in 1903. In the winter of 1889-90, at which time he received his captaincy, a few months spent at the American Museum enabled him to describe several new mammals and birds from his Arizona collections, as well as to complete other manuscripts. During his stay at Fort Snelling, he borrowed a large series of Sparrow Hawks from various friends and museums, and investigated the geographical variation in this species, the results of which were embodied in a paper entitled 'A Study of the Sparrow Hawks (Subgenus *Tinnunculus*) of America, with especial reference to the continental species (*Falco sparverius* Linn.).'¹

When the Mexican-United States International Boundary Commission was organized, in 1891, Dr. Mearns was directed to act as medical officer, with orders to report for duty on Feb. 1, 1892. By "previous correspondence with Lieut. Col. J. W. Barlow, senior commissioner," he had obtained authority to establish "a biological section of the survey, provided this could be accomplished without additional cost" to the Commission. By coöperation with the United States National Museum he was enabled to carry out his designs, and he personally was able to conduct observations along the entire line, from El Paso to the Pacific, including San Clemente Island, which he visited to carry his investigations to their logical terminus. The work was continued up to September, 1894, except for an interval of a few months in the preceding year, when his time was divided between Forts Hancock and Clark, in Texas. During his work on the boundary line he had the services of one assistant for a considerable part of the time, as well as the voluntary aid of his associates on the survey. As a result of their combined industry, about 30,000 specimens were

¹ Auk, IX, July, 1892, 252-270.

collected and transmitted to the U. S. National Museum. The collections had been carefully made, to illustrate changes in the animals and plants in the various faunal areas through which the expedition passed, with the view of throwing some light on subspecific variation in them.

At the close of the Mexican Boundary work, Dr. Mearns was ordered to duty at Fort Meyer, Va., with permission to study his collections at the National Museum. In the time at his disposal he made considerable progress in identifying the mammals, and in discriminating the several life zones of the boundary line. In addition to the faunal zones currently recognized he suggested several lesser geographical areas, which he termed "differentiation tracts." He had planned an elaborate report on the biology, geology, etc., based on the boundary collections, and had accumulated a vast amount of data and manuscript for this purpose, but Congress withheld the sum estimated to cover the cost of printing and illustrations, and the project was reluctantly given up. The first part of his report on the mammals, the only one thus far published, was issued in 1907,¹ and contains upwards of 500 pages, with many plates and text figures. It includes much introductory matter of a general nature, with an itinerary of the expedition, an account of the life areas, lists of the trees, etc., of the Mexican border, and is an excellent example of the careful and detailed methods of its author.

In the autumn of 1896, he devoted his vacation to field work in the Catskills, and to rambles in the vicinity of his old home. A paper entitled 'Notes on the Mammals of the Catskill Mountains, New York, with general remarks on the Fauna and Flora of the Region,'² was based on investigations made at this time.

After a few months' duty at Fort Clark, Texas, in 1897-98, he was commissioned brigade surgeon (later chief surgeon) of Volunteers, with the rank of Major, in the Spanish-American war, serving until March 22, 1899, when he was honorably discharged and resumed his regular duties. His next station was Fort Adams, Rhode Island, where he served during parts of 1899-1900. While

¹ Bull. U. S. Nat. Mus., No. 56, Pt. 1, 1907.

² Proc. U. S. Nat. Mus., XXI, 1898, 341-360, figs. 1-6.

there he joined the Newport Natural History Society, and took an active part in its work, especially in collecting information relative to the present and former status of the mammalian fauna of the State. Toward the close of the year 1900, he suffered a nervous breakdown, probably complicated by earlier attacks of malaria, and was granted several months sick leave, part of which time he passed in Florida in an effort to regain his health. Three months or more were spent in camp in the Kissimmee prairie region, and while there, in February, 1901, he received notice of his advancement to Surgeon, with the rank of Major. Upon his return in May, much benefited by his outdoor life, he stopped at Washington and devoted several weeks to a study of the series of jaguars and other tropical American cats at the National Museum, the results of which appeared in a number of papers published during the next few months.

At Fort Yellowstone, where he was on duty in 1902, he was particularly active in gathering botanical material. It was here that he became aware of the destruction of bird and animal life through the presence of a heavy gas, supposed to be carbon dioxide, which settled in certain depressions and cavities of the earth, causing the death of all small animals that ventured into them. In the course of a few months he detected 16 species of birds, numbering many individuals, that had perished in this manner, and he was of the opinion that "hundreds, if not thousands" died from this cause during the year. He recorded the observations made here in a paper entitled 'Feathers beside the Styx,'¹ and before leaving the Park, he requested the superintendent to have the most dangerous spots provided with wire screens, to prevent the birds entering them.

Military service in the Philippines, which he visited in 1903-1904 and again in 1905-1907, afforded Dr. Mearns his first opportunity to study nature in an entirely new dress. The Islands possessed a rich and varied fauna, with many areas still unexplored or but slightly known, while many problems bearing on the distribution of species within the group remained to be solved. He was largely responsible for the formation of the "Philippine Scien-

¹ Condor, V, 1903, 36-38.

tific Association," a society organized on July 27, 1903, and having as its chief object the promotion of scientific effort in the Philippine Islands. It was begun under the presidency of Major-General Leonard Wood, a broad-minded officer, who encouraged every form of scientific endeavor. Mearns was a most active member of this league from its inception, and his quiet but effective powers of persuasion, and his ability to enthuse others were the means of securing much material and information for later study. During the year covered by his first visit, he served as surgeon in the military department of Mindanao, where his time was fully occupied, so much so, that it was often necessary for him to work far into the night to preserve specimens brought in to him during the day. In his official capacity he accompanied eight punitive expeditions against hostile Moros, but even under these circumstances his collections continued to grow, through the coöperation of his associates. Ethnological material, such as bolos and other native implements and weapons, together with various editions of the Koran, were secured on these forays and utilized as specimens. He accompanied General Wood on three trips of inspection to various islands, some of them zoölogically unknown and rarely visited, and during parts of June and July, 1904, he ascended Mount Apo, the highest peak in the Philippines, where he made general collections and secured much information of value. In the exploration of Mount Apo he was anticipated by two English collectors, who had made collections there hardly a year before.

Hard work, combined with exposure in a tropical climate, had its effect, and in September, 1904, he was sent to the Army General Hospital at San Francisco, suffering from a complication of tropical parasitic disorders. He visited Washington after he had partially recovered his health, and took advantage of the opportunity to study some of his Philippine material, and in a series of five papers issued in the early part of 1905, he described six new genera and twenty-five new species of mammals, a new genus and nineteen new species of birds, besides recording eight species of birds not previously known from the Islands, with notes on other of the rarer forms. Other new types embraced in his collections were made known by experts in several branches of zoölogy.

On July 20, 1905, Mearns stopped at Guam, on his way back

to the Philippines, and here he made the inevitable collection that attended his every pause, however brief, in a new locality. In the few hours spent at Guam he obtained twenty-three birds and a variety of other material. To him every specimen had a potential scientific value, and if worth picking up at all was worth labelling with its full history. This applied to all material, whether in his own chosen field or not, his theory being that if a specimen proved to be of no interest it could be easily discarded at any time.

During the two years of his second period of service in the Philippines he was enabled to reach many interesting and obscurely known islands, having the good fortune to accompany General Wood on tours of inspection to the northernmost and southernmost points of the Archipelago, but space forbids notice of other than his two chief exploits. In May, 1906, he was placed in command of a "Biological and Geographical Reconnaissance of the Malindang Mountain Group," in western Mindanao, which was organized to explore and map the region and make collections of its natural products. This expedition, originally consisting of 21 whites and 28 native carriers, left the old fort at Misamis, on May 9th, and experienced many difficulties, ascending one spur of the mountain after another, only to discover that an impassable gorge several thousand feet deep separated it from the main peak. By May 25th, the party had become reduced to half its original number, through the departure of various members to the coast. The remainder pushed on, and at 11.30 o'clock on the morning of June 4th reached the top of Grand Malindang, the second highest point in the Philippines, and previously unvisited by civilized man. It was foggy and cold, but Dr. Mearns remained on the summit three days and nights to secure a good series of the animal life of that altitude. The return to the coast was comparatively uneventful and occupied only a few days. A good map of the region was prepared, and a number of new animals and plants were discovered, including *Malindangia*, a new genus of birds.

One achievement among Mearns' Philippine experiences stands out more prominently than any other, namely, his ascent of Mount Halcon, which was undertaken at the worst season of the year. This notable expedition, headed by Dr. Mearns, was organized "under the direction and with the support of Maj. Gen. Leonard

Wood," its object being to "determine some feasible route to the mountain, to ascend the highest peak, to secure as much data as possible and to collect objects of natural history." Elmer D. Merrill, botanist of the expedition, has fortunately given an account of this trip, and the extracts here quoted are from his paper. "Halcon the third highest peak in the Philippines, is situated in the north-central part of Mindoro. With no known trails leading to it, surrounded by dense forests, cut off from the coast by difficult ridges and large rivers subject to enormous and appalling floods, it stood seemingly inaccessible. Its location is perhaps in the most humid part of the Philippines, where the rains continue for nine months in the year, in a region geographically quite unknown and inhabited by a sparse population of entirely wild and very timid people, and on an island regarding which there is a widespread and generally accepted belief as to its unhealthfulness. Although within 100 miles of Manila and not more than 15 from Calapan, the capital of Mindoro, so far as I have been able to determine it remained unconquered up to the year 1906." John Whitehead, an English collector, who reached one of the outlying spurs of Halcon in the winter of 1895, wrote of this region: "I have seen a good deal of the tropics, but I never encountered such deluges, such incessant rain, or such thousands of leeches."

The Mearns party, consisting of eleven whites and twenty-two natives, left Calapan on Nov. 1, for Subaan, where it began its journey inland. The expedition discovered several uncharted rivers, which had to be forded or crossed on rude bridges constructed by the party, and progress was impeded by the almost constant rains, the difficulties of trail-cutting, and the swarms of leeches, the latter constituting a notorious drawback to travel in the forests of that region. The privations of the journey are graphically set forth by Merrill, who states that the expedition reached the summit on the afternoon of Nov. 22d, but remained only long enough to take aneroid readings and deposit a record of the trip. The return to the coast was not without trouble, since nearly fourteen days were required to reach Subaan. Carriers sent down in advance for food and supplies had not returned; the remaining members were obliged to carry heavy loads; a bridge made by the party was washed away and had to be rebuilt;

blinding rain continued for days without a pause; two men were lost for several days and later discovered in a half-famished state; and all of the party were on short rations. These and other troubles were incidents of the return trip. At length, however, the party reached Subaan, Dec. 5, after an absence of forty days. The zoölogical results of the trip were disappointing, since only by the exercise of great effort could specimens be prepared, or saved from later destruction by moisture. Furthermore, Dr. Mearns noted that the mountain birds had descended to lower levels to escape the rains, and flocks of them were observed passing up the mountain side when the party was on its return to the coast.

Late in 1907, Dr. Mearns returned from the Philippines, and was ordered to Fort Totten, N. Y., where he remained nearly a year. While at this station he indulged in a garden, and derived much satisfaction from growing a variety of vegetables, and registering in his notebooks the results of his toil, indicating the treatment, yield, and value of each kind planted. It was at Fort Totten that he became aware of the presence of the disease that finally brought his career to an end.

In 1908, President Roosevelt planned an extensive hunting and scientific expedition to Africa, and invited the Smithsonian Institution to participate, with the view of securing the best results in the preservation of both large and small game. The proposition was accepted, and Dr. Mearns was suggested for the position of naturalist. He agreed to undertake the journey, and on Jan. 1, 1909, he was retired, with the rank of Lieut.-Col., but "assigned to active duty with his consent," with orders to "report in person to the President of the United States for duty." Concerning the objects of the expedition President Roosevelt wrote him: "While our collections will be mainly of mammals and birds, yet if we can add reptiles and fresh-water fish, it will certainly be desirable. While not making a special effort in the collection of insects and plants, it will yet be desirable to do all that can conveniently be done in these directions.

"Dr. Walcott recommended you to me as being the best field naturalist and collector in the United States; and as I already knew well the admirable work you had done I was only too glad to assent to the recommendation, and accordingly at his request detailed

you to take charge of the scientific work of the expedition. I know no one who could do it as well."

The party, consisting of Col. Roosevelt, his son Kermit, Dr. Mearns, and Messrs. Heller and Loring, sailed early in March, 1909, and was absent nearly a year. It traversed sections of British East Africa, where Mearns seized the opportunity to collect material on the slopes of Mount Kenia up to the snow line; Uganda, across which he journeyed on foot, to enable him to make better collections and observations; finally passing through the Lado Enclave, down the White Nile to the coast. The course of the expedition and its results are matters of history, and it will suffice here to say that of the upwards of 4000 birds collected over 3000 were obtained by Dr. Mearns, who also secured many small mammals, plants and other objects.

Upon his return to Washington, Dr. Mearns began a general report on the birds, and published several preliminary papers describing new forms obtained on the expedition. While thus engaged, he was requested by Mr. Childs Frick to undertake another African journey, which was to include Abyssinia and little travelled parts of eastern Africa. Although less physically fitted to undertake difficult journeys than formerly, the advantage of having more material for comparison appealed to him and he was unable to resist the temptation. He became a member of this expedition, and the latter part of the year 1911 found him again in Africa, from which he returned in September, 1912. The party entered at Djibouti, French Somaliland, and travelled inland to Dire Daoua, thence to Addis Abeba, the Abyssinian capital. From there it worked generally south by way of the Abaya lakes, through the Galla country, making a loop round Lake Stephanie and skirting the south end of Lake Rudolf, and finally reached Nairobi. Part of the territory traversed was previously unexplored, and the liberal collections made over the whole route enabled Dr. Mearns to add greatly to his knowledge of the birds of eastern Africa. In April, 1912, when the expedition was in a remote part of southern Abyssinia, his son, Louis Mearns, a most estimable and promising young man, who had accompanied him on many lesser collecting trips, died in Baltimore, Md. The news of this sad occurrence, which was withheld by his family until his return to the United States, proved a severe shock to him.

With largely increased collections — the Frick expedition having added over 5000 birds to his available material — Dr. Mearns again resumed his studies, intending to work up all of the African series together. He had been relieved from further active duty at the end of the year 1910, and felt he could at last make his plans and move as he pleased. For years he had cherished the desire to settle down to museum research, to work over his collections and complete reports long projected. The opportunity was now at hand, but, alas! not to be realized. The privations and exposure of his many travels, together with the progress of his malady, had so undermined his system that his vitality had reached a low ebb. He continued at work for two or three years, with ever widening periods of inability to reach his office. Thinking to benefit his condition, he made several short field trips in this period, from which he returned without much improvement, and at length he succumbed, in the midst of his greatest undertaking, surrounded by a wealth of material that was largely the result of his own industry. He passed away at the Walter Reed Army General Hospital, in Washington, Nov. 1, 1916, leaving his mother, widow, daughter, and a large number of friends to mourn his loss.

Dr. Mearns was of an exceedingly generous disposition, one who had no desire to retain the fruits of his labor for his own glory and satisfaction, but preferred to donate them to museums where they would be accessible to all for study. His earlier collections, made up to 1891, went to the American Museum of Natural History, and later ones were given with equal liberality to the United States National Museum. Of shells, and probably other objects collected in large quantity, he distributed sets to various museums, while a series of human skeletons and crania from the cliff dwellings at Fort Verde was sent to the Army Medical Museum. An inkling of the importance of his contributions may be gathered from the statement of Standley (1917), who writes "As naturalist of the Mexican Boundary Survey of 1892-93 he collected or had collected under his direction the largest and best representation ever obtained, consisting of several thousand numbers, of the flora of that part of the United States and Mexican boundary which extends from El Paso, Texas, to San Diego, California. Dr. Mearns secured also what is undoubtedly the largest series of plants ever obtained

in the Yellowstone National Park, and in addition he collected extensively in the Philippines, Arizona, Florida, Rhode Island, Minnesota, and southern New York. All his collections are deposited in the U. S. National Museum, and probably no one person has contributed a larger number of plants to that institution." Hollister, in 1913, referring to Philippine mammals, said that of 1454 specimens in the National Museum, "probably by far the largest collection from the archipelago in any museum," Dr. Mearns had given 1012. More impressive figures may be cited in the case of birds, when it is known that more than one tenth of the total number of specimens of birds in the U. S. National Museum were either collected or contributed by him.

The published writings of Dr. Mearns number about 125 titles, chiefly on biological subjects, although medicine, archaeology, and biography are also represented. Fifty or more new species of animals and plants have been named in his honor, as well as three genera, the latter constituting a rather unusual distinction. *Mearnsia*, a tree of the myrtle family, is a native of the slopes of Mount Halcon, and the same name has been conferred on a rare swift from the island of Mindanao, while *Mearnsella* commemorates a genus of fishes from the last named locality.

Dr. Mearns was a Patron of the American Museum of Natural History; Associate in Zoölogy of the National Museum; Correspondent of the Academy of Natural Sciences of Philadelphia; Fellow of the American Ornithologists' Union; Member of the National Geographic Society, of the Biological Society of Washington, of the Linnaean Society of New York, and of various other societies.

For one who had engaged in many difficult journeys, Dr. Mearns was of rather frail build, not more than five feet four inches in height, and probably never weighed much in excess of 140 lbs., but he was blessed with a spirit of determination that enabled him to accomplish nearly every task he undertook. Withal he was modest and unassuming in demeanor and seldom referred to his own exploits, but was a good auditor and always interested in the experiences of his friends. He avoided arguments and never indulged in criticism of others; was fair and impartial in his appraisal of men. He was always willing to seek advice and

give weight to the opinions of others. Serene and placid in disposition, cheerful and optimistic in temperament, he was fond of the beautiful in nature and art, even of poetry, yet philosophical and analytical and systematic by nature. As a friend, he was sympathetic, generous, steadfast, and intensely loyal.

NOTES ON THE BREEDING BIRDS OF PENNSYLVANIA AND NEW JERSEY.

BY RICHARD C. HARLOW.

SINCE the publication of Dr. Witmer Stone's two works: 'The Birds of Eastern Pennsylvania and New Jersey' (1894) and 'The Birds of New Jersey' (1909) the writer has done considerable field work in various parts of both states and portions of every nesting season from 1904 to 1917 have been spent in investigating the breeding habits of the resident or summer resident species. A large amount of data has naturally been collected much of which adds materially to our knowledge of the breeding range and relative abundance of the birds of Pennsylvania and New Jersey.

Some time ago Dr. Stone urged the writer to publish a summary of his observations making the pertinent remark that "the main trouble with oölogists is that they publish altogether too few of their records". It is undoubtedly true that many important nests are found every year about which nothing appears in print and the data concerning them would yield valuable information regarding the distribution and time of breeding of the species.

Acting upon Dr. Stone's suggestion the present paper has been prepared. Under each species are given the number of nests examined; the average number of eggs in a complete set, as well as the extremes, in order to show the range of variation; and the average and extreme dates for complete sets. Additional information is given under certain species and in the case of rare species

full data are given for each nest found. My field work has covered most of southern New Jersey from Mercer County and the Hackensack marshes to Cape May; and a majority of the counties of Pennsylvania, although the northwestern part of the state has not been studied as thoroughly as the other portions.

It has been thought best to consider all of the species given by Dr. Stone as possible breeders giving my data for such as I have found nesting and my reasons for regarding others as no longer breeding within our limits.

All the data presented are the result of my own studies except in a few cases where credit is given to others and in a few species which I have been unable to find breeding but whose nests others have found.

1. **Podilymbus podiceps.** PIED-BILLED GREBE.—Regular but scarce summer resident in the Hackensack marshes of northern New Jersey. Very rare summer resident in Pennsylvania where birds have been observed in the nesting season in Franklin, Sullivan, and Center Counties and the Cuckoo-like mating call heard. I have found four nests: 1. Newark, N. J.; June 6, 1908; five newly hatched young and one egg. 2. Newark, N. J.; June 6, 1908; six eggs. 3. Scotia, Center Co., Pa.; May 14, 1917; six eggs. 4. Scotia, Center Co., Pa.; July 10, 1917; six hatching eggs. Nests 3 and 4 were the product of the same pair of birds.

2. **Gavia immer.** LOON.—I know of but one instance of the Loon nesting in Pennsylvania or New Jersey, a nest found by Mr. Chas. Homan in May, 1908, near Bushkill, Monroe Co., Pa., which contained two eggs. (cf. Harlow, Auk, 1908, p. 471.)

3. **Larus atricilla.** LAUGHING GULL.—Regular breeder on the marshy islands on the coast of New Jersey, from Ocean Co. southward, and apparently holding its own. Data on fifty nests give: average set of eggs 3 (2-4); average date June 6 (May 25-July 15).

4. **Sterna hirundo.** COMMON TERN.—Regular breeder along the coast of New Jersey, where it is slowly increasing in numbers. I have breeding records from Ocean to Cape May Counties. Data on twenty-five nests give: average set of eggs 3 (2-4); average date, June 10.

5. **Sterna antillarum.** LEAST TERN.—After being practically exterminated on the New Jersey coast this species is beginning to reestablish itself. I have found two small colonies in Burlington County and at the time of my last visit, in 1916, they were holding their own. Data on seventeen nests give: average set of eggs, 3 (1-2); average date, June 12.

6. **Rynchops nigra.** BLACK SKIMMER.—Practically extinct in New Jersey until 1910 when two pairs were found on the coast islands of Atlantic County. Since then I have found two or three pairs present every year

and have found three nests: 1. Atlantic County, N. J.; June 15, 1915; three eggs. 2. Atlantic County, N. J.; June 15, 1915; four eggs. 3. Atlantic County, N. J.; June 17, 1916; three eggs.

[*Mergus americanus*. Merganser.—

[*Lophodytes cucullatus*. Hooded Merganser.—

[*Nettion carolinense*. Green-winged Teal.—

[*Marila affinis*. Lesser Scaup.— These four ducks were mentioned in Stone's work as possible breeders in Pennsylvania, but careful search has failed to discover any evidence of the fact and I feel confident that they cannot now be classed as summer residents.]

7. *Anas platyrhynchos*. MALLARD.— I have been unable to find the Mallard nesting near Williamsport or on the Loyalsock Creek where it had been formerly supposed to breed. It is however, a rare summer resident in Erie County and I have found a single nest on the New Jersey coast, in Burlington County, June 16, 1915, containing ten hatching eggs. Female and young seen several times later close at hand.

8. *Anas rubripes*. BLACK DUCK.— Rare but regular breeder along the coast of New Jersey from Ocean to Cape May Counties. In Pennsylvania, Mr. R. F. Miller and the writer saw a pair at Tinicum, Delaware County, June 18, 1913, which from their actions appeared to be breeding. I have also summer records from Erie and Fayette Counties. I have data from two nests: 1. Ocean Co., N. J.; July 3, 1914; eight eggs. 2. Ocean Co., N. J.; May 20, 1916; nine eggs.

9. *Aix sponsa*. WOOD DUCK.— Still breeds in both states although it has been almost exterminated. I have found them under circumstances which point to their breeding in Burlington, Cape May, and Cumberland Counties, N. J., and in Lancaster, Bedford and Pike Counties, Pa.

10. *Botaurus lentiginosus*. BITTERN.— In New Jersey, contrary to the published statements I have found the Bittern breeding regularly and fairly commonly on the salt marshes from Ocean to Cape May Counties as well as on the Delaware Bay shore. In Pennsylvania I have but two records; two young at Lamont, Center Co., June 17, 1909, and a pair present at Charter Oak, April-July, 1917, Huntington Co. It is apparently a very rare breeder in this state. Data on twelve nests give: average number of eggs in a set, 4 (3-5); average date, May 25 (latest July 18).

11. *Ixobrychus exilis*. LEAST BITTERN.— A rare breeder in suitable salt marshes along the New Jersey coast, becoming more common in the fresh water swamps toward the Delaware River and very common on the Hackensack meadows. In Pennsylvania it is very common in the Delaware marshes as far north as Bucks County. I have not found it breeding inland. Data recorded on forty-two nests give: average set 5 (3-6); average date, May 30 (May 22-July 12).

12. *Ardea herodias herodias*. GREAT BLUE HERON.— Still found in rapidly decreasing numbers in both states but only in the more remote places, as heronries in the settled districts are always broken up. They breed regularly but not commonly in the mountainous districts of

Pennsylvania. Data on sixteen nests give: average set, 5 (3-6); average date, April 15 (earliest April 8).

13. *Butorides virescens virescens*. GREEN HERON.—Very common breeder except in the wilder and timbered mountain districts where it is rare. Data on twenty-six nests give: average set, 5 (3-6); average date—fourteen southern New Jersey nests, May 24; eight central and northern Pennsylvania nests, June 1.

14. *Nycticorax nycticorax naevius*. BLACK-CROWNED NIGHT HERON.—Common summer resident in southern New Jersey and southeastern Pennsylvania north to Belvidere and Northampton County. I have never found it in the mountains and but rarely west of the Alleghanies. Data on sixty nests give: average set, 4 (3-6); average date April 25 (latest, June 6).

15. *Rallus elegans*. KING RAIL.—Confined to the Delaware valley from Bridesburg to Tinicum where it is a rather scarce breeder and probably south to Delaware Bay. Data on five nests give, average set 9 or 10 (6-13); average date, June 5 (earliest, May 30).

16. *Rallus crepitans*. CLAPPER RAIL.—Very abundant on the New Jersey salt marshes becoming scarcer from Ocean County northward. Data on twelve nests give: average set, 10 or 11 (6-15); average date, May 30 (May 20-July 15).

17. *Rallus virginianus* VIRGINIA RAIL.—A common but local breeder in marshes throughout Pennsylvania except in the higher mountain districts and west of the Alleghanies where I have no records. It is especially plentiful in the level valleys of central Pennsylvania.

In New Jersey I have found it nesting on the salt marshes in Ocean and Burlington Counties, though not commonly, and also along the Delaware. Data on seventeen nests give: average set on the salt marshes, 7 (6-8), in central Pennsylvania 10 (9-14); average date, salt marshes, June 7, central Pennsylvania May 16 (May 10-June 27). I am at a loss to account for the early nesting of the birds from central Pennsylvania. That the nests from the salt marshes are not abnormally late is shown by the records of ten others from the Delaware valley which average June 5.

18. *Porzana carolina*. SORA.—A rare breeder in the Delaware valley at Bridesburg but abundant in suitable marshes in central Pennsylvania where I have found it nesting in Center, Mifflin, Clearfield, Huntington, and Synder Counties. Data on thirty-two nests from the latter district give: average set, 10 (8-15); average date, May 17 (May 10-June 11).

19. *Creciscus jamaicensis*. BLACK RAIL.—Contrary to all precedent the writer has found this rail a common though local breeder in suitable salt marshes along the New Jersey coast in Ocean, Burlington and Atlantic Counties, as well as on the edges of the coast islands. Its secretive habits and the fact that it is very difficult to flush probably account for the rarity of the eggs in collections. The writer has personally found eighteen nests and has examined a number of others. Data recorded on

twenty-four nests give the following: average set 7 (6-9), one set of 13; average date June 14 (June 6-July 23).

20. **Gallinula galeata.** FLORIDA GALLINULE.—Breeds regularly along the Delaware from Bridesburg to Tinicum on both sides of the river, also in the Hackensack marshes. Data on twenty-six nests give: average set, 10 (6-14); average date June 1 (May 22-July 12).

21. **Fulica americana.** COOT.—Seen on June 6, 1908, in the Hackensack marshes where it has been found nesting by others (Auk, 1907, p. 436.) I can find no evidence of its nesting in Pennsylvania at the present time.

22. **Philohela minor.** WOODCOCK.—A scarce but regular breeder in southern New Jersey and still found in suitable localities in the mountainous districts of Pennsylvania, especially in Huntington County. Very scarce in thickly populated sections of both states. I have data on but four nests: 1. Rio Grande, Cape May Co., New Jersey, May 9, 1908; four eggs hatching. 2. Barnegat, Ocean Co., N. J., April 20, 1914, four eggs. 3. Charter Oak, Huntington Co., Pa., April 8, 1917, four eggs. 4. Charter Oak, Huntington Co., Pa., April 14, 1917, four eggs.

[**Gallinago delicata.** WILSON'S SNIPER.—I have been unable to obtain any evidence of the breeding of this species in either Pennsylvania or New Jersey, though it was formerly supposed to be a summer resident in the northern parts of both states.]

[**Totanus melanoleucus.** GREATER YELLOWLEGS.—I have seen pairs of this bird performing their mating antics on the coast marshes of New Jersey as late as May 25 and they have circled about me calling constantly. I have also noted them in Ocean County as early as July 5 — migrating birds, of course, in both cases. May not instances such as these have prompted Ord's statement that they bred in New Jersey?]

23. **Helodromas solitarius solitarius.** SOLITARY SANDPIPER.—A very rare breeder in the higher mountainous districts. I have only one breeding record, an old bird with young, at La Anna, Pike County, Pa. (see Oölogist, March, 1906).

24. **Bartramia longicauda.** UPLAND PLOVER.—Rare but regular breeding bird in the open farming country of southern Pennsylvania. I have noted them in summer in Bucks, Chester, Lancaster, Dauphin, Adams, Cumberland, Northumberland, Mifflin, Snyder, Center, Indiana, and Greene Counties. Three pairs bred within eight miles of State College, Center Co. in 1917. I have found two nests: 1. George School, Bucks Co., Pa., May 18, 1908; four eggs. 2. Newtown, Bucks Co., Pa., May 24, 1910; four eggs.

25. **Actitis macularia.** SPOTTED SANDPIPER.—Breeds abundantly throughout both states. Data on sixteen nests give: average set 4; average date, May 28 (May 16-June 18).

26. **Oxyechus vociferus.** KILLDEER.—Common through both states as far north as Center Co., Pennsylvania, rare in the northern counties and absent from the higher mountains. Data on eighteen nests give: average set 4; average date, May 1 (April 20-June 18).

27. *Ægialitis meloda*. PIPING PLOVER.—A set of four eggs in my collection was taken at Beach Haven, N. J., June 8, 1886 (recorded by Stone, 'Birds of N. J.', p. 146). I have no more recent record.

28. *Colinus virginianus virginianus*. BOB-WHITE.—Formerly breeding plentifully in the lower parts of both states, and rarely even as far north as Warren and Pike Counties, Pa. Now very much reduced in numbers and locally distributed, more abundant in southern New Jersey than elsewhere. Data on three New Jersey nests are as follow: 1. Ocean Co., N. J., July 6, 1914; seventeen eggs. 2. Ocean Co., N. J., June 14, 1915; nineteen eggs. 3. Cape May Co., N. J., May 27, 1916; sixteen eggs.

29. *Bonasa umbellus umbellus*. RUFFED GROUSE.—Common in the mountainous districts of Pennsylvania, breeding from Warren to Pike Counties on the north, and from Franklin to Bedford Counties on the south. Rare in the well populated sections. In southern New Jersey it occurs rather uncommonly but I have found it nesting in Cape May County. Data on seventeen Pennsylvania nests give: average set, 10 or 11 (6-15); average date, May 4 (April 26-June 12).

30. *Meleagris gallopavo silvestris*. WILD TURKEY.—Scarce but regular breeder in the wilder parts of south central Pennsylvania, from Center, Clearfield and Lycoming Counties to Somerset and Franklin. I have found them fairly common in Stone Valley, Huntington County. Data on three nests are appended: 1. Vail, Blair Co., Pa., May 17, 1912; six eggs. 2. Greenwood Furnace, Huntington Co., Pa., May 20, 1915; twelve eggs. 3. Bear Meadows, Center Co., Pa., June 22, 1916; twelve eggs.

[*Ectopistes migratorius*. WILD PIGEON.—Inquiries in Pike and Wayne Counties, Pa., have brought forth the fact that the last breeding in the beech woods there occurred in the late seventies.]

31. *Zenaidura macroura carolinensis*. MOURNING DOVE.—Very common over the greater part of both states but much rarer in the northern mountainous districts of Pennsylvania. Data on thirty-one nests give: average set, 2; average date — for first sets, April 15 (earliest, April 4); for second sets, June 10 (latest, August 4).

32. *Cathartes aura septentrionalis*. TURKEY VULTURE.—Very common in southern New Jersey as well as in Delaware and Chester Counties, Pennsylvania, and less so in Montgomery. Plentiful in the Susquehanna valley as far north as Dauphin and Perry Counties and breeding regularly but less abundantly to Northumberland and Center Counties. I have not found it west of the Alleghanies. Data on nine nests give: average set, 2; average date, May 1 (April 20-May 26).

33. *Circus hudsonius*. MARSH HAWK.—Regular and fairly common breeder on the salt marshes of the New Jersey coast, where I have found twelve nests in Ocean, Burlington and Atlantic Counties and have observed the birds in summer from Cape May to Newark. It nests rarely in central Pennsylvania, in Center and Huntington Counties, and more

regularly in Erie County. Data on twelve New Jersey nests give: average set, 5 (4-7); average date, May 25 (May 14-July 9).

34. **Accipiter velox.** SHARP-SHINNED HAWK.—Rapidly decreasing in numbers and now one of the rarest breeding hawks in both states. A set of eggs in my collection taken at Clementon, N. J., on June 1, 1915, is my nearest record to Philadelphia as well as the most recent one for this district. I have noticed this hawk as a rare summer resident in Berks, Monroe, Pike, Wayne, Center, Huntington, Mifflin, Lycoming, and Alleghany Counties. Data on nine nests give: average set, 5 (3-6); average date, May 25 (May 14-June 29).

35. **Accipiter cooperi.** COOPER'S HAWK.—A breeding bird throughout both states, becoming much rarer in the northern, mountainous parts of Pennsylvania. Data on twenty-four nests give: average set, 5 (3-6); average date, May 5 (April 23-June 10).

36. **Astur atricapillus atricapillus.** GOSHAWK.—A very rare breeder in the few heavily timbered, most boreal, mountain districts of Pennsylvania. Apparently does not breed on the Pocono plateau. A set of two eggs taken in Warren County, Pa., on April 3, 1910, in my collection.

37. **Buteo borealis borealis.** RED-TAILED HAWK.—Breeds rarely in southeastern Pennsylvania, more commonly in the southern tier of counties to the westward and very commonly in the southwestern counties, Greene and Washington, as well as in Warren and Indiana. I have been unable to find it nesting in central or northeastern Pennsylvania or in southern New Jersey. Stone, in his 'Birds of New Jersey' gives it as a common resident but if there is a definite record of its nesting in the southern counties I have failed to find it. Data on nine nests give: average set, 2 (3); average date April 6 (March 24-April 20).

38. **Buteo lineatus lineatus.** RED-SHOULDERED HAWK.—In New Jersey it is a scarce but regular summer resident in the southern counties becoming very common in the northern half of the state. In Pennsylvania it is a rare breeder in the southeastern portion and in Greene County in the southwest; more common from Alleghany county north and quite common in the mountains from Warren to Monroe, avoiding the central counties but becoming the common breeding hawk of the Pocono plateau. Data on nineteen nests give: average set, 3 (2-4); average date, April 23 (April 15-May 25).

39. **Buteo platypterus.** BROAD-WINGED HAWK.—Scarce but regular summer resident in southern New Jersey where I have found them under circumstances that left no doubt but that they were breeding, in all the southern counties. In Pennsylvania it is fairly well distributed in the breeding season being most plentiful in Chester, Delaware and the central counties, and least common in the most northern mountainous counties. I have found its nests north to Pike County in the east and from Alleghany to Warren in the west. Data on twelve nests give: average set, 2-3 (4); average date, May 15 (May 7-June 13).

40. *Haliaeetus leucocephalus leucocephalus*. BALD EAGLE.—Almost if not quite extinct as a breeding bird in New Jersey, though formerly nesting regularly in Salem, Cumberland, Cape May, and Burlington Counties. In Pennsylvania I know of an occupied nest in Erie County and a pair may still nest along the Susquehanna, in Lancaster County, though the former well known eyries of that locality have not been occupied during the last two years. Probably a pair or two breed in the wild lake region of Pike, Wayne and Monroe Counties, where I still see them frequently. I have known of Eagles nesting at the following places in Pennsylvania in the last ten years, all of which are now deserted owing to the birds having been shot, or the nest trees falling down, viz: Washington Boro and Peach Bottom, Lancaster Co., Milford, Pike Co., and Towanda Bradford Co. Data on three nests follow: 1. Towanda, Bradford Co., Pa., Feb. 28, 1914; two eggs. 2. Washington Boro, Lancaster Co., Pa., March 2, 1915; two eggs. 3. Erie Co., Pa., May 15, 1915; two large young.

41. *Falco peregrinus anatum*. DUCK HAWK.—This magnificent falcon still breeds at a number of places in Pennsylvania. I have known of eight pairs nesting in the state within the past five years — along the Delaware from the Nockamixon cliffs to Monroe County and along the Susquehanna from Lancaster to Bradford Counties, as well as near the cities of Williamsport and Scranton. Data on seven nests give: average set, 4 (3-5); average date, April 15 (April 8-April 29).

42. *Falco sparverius sparverius*. SPARROW HAWK. — Breeds throughout New Jersey though not commonly in the southern counties or near the coast. Very common in the southern half of Pennsylvania becoming much scarcer in the northern and wilder mountainous sections. It is a rare breeder on the Pocono plateau, in my experience. Data on thirty-six nests give: average set, 5 (3-6); average date April 28 (April 13-June 4).

43. *Pandion haliaetus carolinensis*. OSPREY.—Nests commonly along the New Jersey coast, being most plentiful in Cape May and Cumberland Counties and nesting up the Bay shore as far as Salem County. In Pennsylvania it is a rare breeder on the lakes of the northeastern counties and at Foxburg, Clarion County. Data on seventy-five nests give: average set, 3 (2-4); average date, May 20 (May 7-June 10).

44. *Aluco pratincola*. BARN OWL.—I have found the Barn Owl only in southeastern Pennsylvania — in Delaware, Chester, Montgomery and Cumberland Counties. Data on eight nests give: average set, 6 or 7 (4-8); average date, April 1 (February 28-June 8).

45. *Asio wilsonianus*. LONG-EARED OWL.—This owl in my experience is a very rare breeder in both states. I have only one record, a set of three eggs found in Berks County, Pa.

46. *Asio flammeus*. SHORT-EARED OWL.—A very rare summer resident on the salt marshes of the New Jersey coast, where I have seen them and found their pellets in the summer months in Ocean and Burling-

ton Counties. I have found but one nest — June 17, 1915, on an island in Barnegat Bay, containing five half fledged young.

47. ***Strix varia varia***. BARRED OWL.— Apparently a regular though scarce breeding bird throughout New Jersey. I have seen them in April or May, in Cape May, Cumberland, Ocean, Atlantic, Burlington and Salem Counties. In Pennsylvania I have found it only in the wilder mountainous sections, from Warren to Pike Counties and south to Franklin. I have found only one nest — June 1, 1912, Warren Co., Pa. containing three eggs. This date seems entirely too late to be normal.

48. ***Cryptoglaux acadica acadica***. SAW-WHET OWL.— I have but one summer record for this species, a bird seen in northern Huntingdon County, Pa., on May 26, 1913, and as this individual was blind in one eye it was possibly not a breeding bird. Young birds have however been taken in the mountains by others, as is well known.

49. ***Otus asio asio***. SCREECH OWL.— Very common in both states but becoming much rarer in the mountainous districts and not found at all in the primæval forests. Data recorded on twenty-one nests give: average set 4 (3-6); average date, April 10 (April 1-May 4).

50. ***Bubo virginianus virginianus***. GREAT HORNED OWL.— Rare resident in New Jersey confined mainly to the wilder sections. I have found it several times in Salem County during the nesting season. In Pennsylvania it is generally distributed, everywhere scarce, and becoming exterminated in all but the wilder sections. Three nests were found at Waynesburg, Green Co., Pa., 1. February 24, 1916, 2 eggs; 2. March 27, 1914, three half-fledged young; 3. March 28, 1914, two half-fledged young. Another nest March 12, 1914, at Charter Oak, Huntingdon Co., Pa., contained two newly hatched young.

51. ***Coccyzus americanus americanus***. YELLOW-BILLED CUCKOO.— A common breeding bird in the lower ground of both states becoming less plentiful towards the mountains. I have not found it in the boreal parts of Pennsylvania. Data on twenty-four nests give: average set, 3 (2-5); average date, June 15 (May 24-August 15).

52. ***Coccyzus erythrophthalmus***. BLACK-BILLED CUCKOO.— Replaces the former species in the northern and mountainous parts of both states, and a rare breeding bird in the southern counties, especially east of the mountains. Data on nine nests give: average set, 3 (2-7); average date June 10 (April 29-June 23).

53. ***Ceryle alcyon alcyon***. BELTED KINGFISHER.— Generally distributed throughout both states all the way from the coast of New Jersey to the tops of the Alleghanies, in suitable locations. Data on twenty-eight nests give: average set, 6 or 7 (5-8); average date, May 10 (April 29-June 23).

54. ***Dryobates villosus villosus***. HAIRY WOODPECKER.— A regular breeding bird over practically the entire area of both states. Particularly common in Greene County in the southwestern corner of Pennsylvania and on the Pocono plateau. Data on sixteen nests give: average set, 4 (3-5); average date, April 25 (April 12-May 14).

55. **Dryobates pubescens medianus.** DOWNY WOODPECKER.— Very common throughout both states except in the wilder mountainous sections where it is much less plentiful. Data on thirty-two nests give: average set, 5 (3–6); average date, May 14 (May 1–June 2).

56. **Sphyrapicus varius varius.** YELLOW-BELLIED SAPSUCKER.— I have found this species nowhere a common summer resident of Pennsylvania and confined to the highest and most boreal parts of Warren, Pike, Wayne and Monroe Counties. I question the statement in Warren's 'Birds of Pennsylvania,' that it breeds in Cumberland County, as his informant probably confused this with one of the preceding species, all three being confused in the popular mind. I found a nest at Pocono Lake, Monroe County on June 17, 1908, but with the set not completed, and another at South Sterling, Wayne County, with a set of four eggs, on June 11, 1917.

57. **Phlœotous pileatus abieticola.** NORTHERN PILEATED WOODPECKER.— Still breeds regularly though locally in the wilder mountainous sections of Pennsylvania, from Monroe, Wayne and Pike Counties to Warren and south to Huntington; also in Greene County, along the West Virginia line. Steadily decreasing in numbers. I have found five nests: 1. Shingletown, Center Co., Pa., May 2, 1912; two eggs. 2. Monroe Furnace, Huntington Co., Pa., May 8, 1913; four eggs. 3. LaAnna, Pike Co., Pa., May 18, 1913; four eggs. 4. Mooresville, Huntington Co., Pa., May, 15, 1914; four eggs. 5. Charter Oak, Huntington Co. Pa., May 11, 1917; four eggs.

58. **Melanerpes erythrocephalus.** RED-HEADED WOODPECKER.— Scarce and very local in New Jersey and very rare in the southern half of the state, where I have seen them in Camden, and Burlington Counties and once in Gloucester. In Pennsylvania it is locally distributed breeding in the east from Chester and Delaware Counties to Pike. It is rare in the northern and mountainous regions being there confined to burnt-over districts or to water killed trees in ponds. It is resident and very common in Center County but west of the Alleghanies I have found it only in Warren County. Data on twenty-eight nests give: average set, 5 (3–6); average date, June 3 (May 24–July 11).

59. **Centurus carolinus.** RED-BELLIED WOODPECKER.— A scarce but regular breeder in Washington and Greene Counties in the southwest corner of Pennsylvania. A set of four eggs in my collection was taken in Green County on May 3, 1907.

60. **Colaptes auratus luteus.** NORTHERN FLICKER.— Breeds abundantly throughout both states, becoming scarcer in the wilder mountainous districts, where however it nests in slashings miles from civilization. Data on one hundred and sixteen nests give: average set, 7 (5–13); average date, May 12 (April 24–June 16).

61. **Antrostomus vociferus vociferus.** WHIP-POOR-WILL.— Common breeder in less settled sections throughout New Jersey, occurring in the greatest numbers in the swamps of Cape May, Atlantic, Burlington and Cumberland Counties. In Pennsylvania I have found it commonly

throughout the mountains and also in Greene County. Data on seven nests give: average set, 2; average date, May 28 (May 14, Pike Co., Pa.—June 20, Greene Co.).

62. *Chordeiles virginianus virginianus*. NIGHTHAWK.—Locally distributed throughout both states. Most common in parts of Berks County, Pennsylvania. Nests regularly on the gravel rooves of houses in Pittsburgh. Data on eight nests give: average set, 2; average date, June 1 (May 24–June 29).

63. *Chætura pelagica*. CHIMNEY SWIFT.—Abundant breeder throughout both states. In the wilder regions it still sometimes nests in hollow stumps and in Pike and Monroe Counties, Pa., I have found three nests in dark barns. Data on twelve nests give: average set 4 (3–5); average date, June 6 (May 24–July 15).

64. *Archilochus colubris*. RUBY-THROATED HUMMINGBIRD.—Locally distributed; apparently most abundant in southern New Jersey, and on the Pocono plateau and in Greene County, Pennsylvania. Data on seventeen nests give: average set, 2; average date,—six nests southern New Jersey, May 28, four nests southern Penna., June 1, seven nests, northern Penna., June 7.

65. *Tyrannus tyrannus*. KINGBIRD.—Common and generally distributed. Data on thirty-five nests give: average set, 3 (4); average date — 12 southern New Jersey nests, May 30, fourteen northern Penna. nests, June 7.

66. *Myiarchus crinitus*. GREAT CRESTED FLYCATCHER.—Common though somewhat locally distributed and absent or very local in the mountains. Data on twenty-six nests give: average set 5 (4–6); average date, June 5 (May 26–June 24).

67. *Sayornis phœbe*. PHŒBE.—Abundant over the greater part of both states but rather scarce in southern New Jersey especially in Cape May County. Data on one hundred and seventy nests: average set, 5 (3–6); average date — first sets April 25 (earliest April 12); second sets, June 8 (latest July 18).

68. *Nuttallornis borealis*. OLIVE-SIDED FLYCATCHER.—A very rare summer resident in the boreal regions of Pennsylvania. I have found it only in Pike, Wayne, Monroe and Warren Counties. A set of two eggs in my collection was taken at Warren, June 24, 1904.

69. *Myiochanes virens*. WOOD PEWEE.—Very common and generally distributed. Data on fourteen nests give: average set, 2 or 3; average date, June 10 (June 3–August 1).

70. *Empidonax flaviventris*. YELLOW-BELLIED FLYCATCHER.—I have one summer record of this species for Warren County, Pa., and two for Monroe. It has been found nesting by others (see Auk, 1916, p. 200).

71. *Empidonax trailli alnorum*. ALDER FLYCATCHER.—I have found the Alder Flycatcher in summer only at Cresco and Pocono Lake, Monroe County and Gouldsboro, Wayne County, Pennsylvania. (For record of nests see Auk, 1916, p. 199).

72. **Empidonax virescens.** ACADIAN FLYCATCHER.—Breeds over the low ground of both states, and ranges up the river valleys, rarely into the mountains. I have found it in Center County nesting in the same ravine with such species as the Canada Warbler and Solitary Vireo. Scarce in Cape May Co., N. J. Data on twenty-six nests give: average set, 3 (2); average date, June 6 (May 30–July 16).

73. **Empidonax minimus.** LEAST FLYCATCHER.—Breeds commonly over the northern half of New Jersey and the mountainous parts of Pennsylvania south to Berks and Center Counties and rarely to Montgomery. Data on twenty-one nests give: average set, 4 (3); average date May 30 (May 25–June 27).

(To be concluded.)

UNCOLORED PRINTS FROM HAVELL'S ENGRAVINGS OF AUDUBON'S 'BIRDS OF AMERICA'.

BY HARRY HARRIS.

Plates II and III.

EIGHT uncolored prints of Audubon's folio plates have lately come into the writer's possession, and their examination has led to a closer study of the work of the engraver. A careful comparison of the prints with the corresponding published issues has brought out a few points which may prove of interest, especially as the comparatively scant reference to Robert Havell Jr. found in the literature of American Ornithology perhaps indicates that complete recognition has not been given this master engraver for his part in immortalizing the genius of Audubon.

Mr. George Alfred Williams of Summit, N. J., has lately said,¹ in a very illuminating review of Havell's career, that to the genius of this man is due much of the extraordinary artistic success which

¹ Williams, George Alfred. Robert Havell, Junior, Engraver of Audubon's "The Birds of America." The Print-Collector's Quarterly. October, 1916. Houghton, Mifflin Co., Boston.

attended the publication of the drawings of the great naturalist and that without the coöperation of a talent capable of the task of faithful, intelligent, and artistic reproduction, the work would have failed of its ultimate purpose.

Audubon at first entrusted the engraving of his plates to W. H. Lizars, one of the greatest engravers of bird-portraits of his time. His results however did not satisfy Audubon's demands, and after five plates had been done the work was taken from his hands and given over to Robert Havell Jr., of London. This Havell, the last of a long line of artists and workers in copper-plate, was the sole engraver of all the Audubon plates, save the five referred to, and three of these were later retouched by him. That the elder Havell engraved any of the plates is clearly disproved in the article above quoted.

Havell's work at all times fully met the rigid requirements of Audubon, who on more than one occasion expressed with enthusiasm his entire satisfaction in the quality of Havell's engraving.

Late in 1838, after the last part of 'The Birds of America' had issued and when Havell was dismantling his plant preparatory to removal to America, he wrote to Audubon for instructions relative to the manner of packing "five perfect sets" and certain "loose sets." This reference to loose sets presumably included all the trial proofs worthy of preservation, together with all other prints that had accumulated during the twelve years of work, and, for one reason or another, had not been colored. Audubon's reply¹ to this inquiry, under date of February 20, 1839, indicated that he did not know the nature of these loose sets but he states particularly that he wanted them saved. A prolonged search of all available sources of information has failed to disclose another reference to these loose sets. There is no reasonable doubt, however, that they were *all* shipped to Audubon, since those that have been preserved to the present day are directly traceable to him or his descendants. No record of their number seems to have been kept by either Audubon or Havell. I am informed by Mr. Williams that the only prints brought to this country by Havell, aside from the superb set colored

¹ Dean, Ruthven. The Copper-Plates of the Folio Edition of Audubon's 'Birds of America,' With a Brief Sketch of the Engravers. Auk, Vol. XXV, No. 4, 1908.



FROM THE COLORED PLATE.

entirely by himself, were his own working proofs. These proofs, now owned by Mr. Williams, are cut into small portions, probably for the greater convenience of the engraver in handling.

Mr. Ruthven Dean, who has thrown so much light on obscure matters pertaining to Auduboniana, writes that he has in his possession an uncolored proof from the Foolish Guillemot plate and that he has data referring to some three hundred other black prints which were at one time in the hands of Audubon. This number indicates the existence of approximately a complete set.

The eight prints¹ above referred to as discovered by the writer were presented some time during the year 1850 — together with others since destroyed by fire — by M. and Mme. Audubon to their friend and neighbor Judge John B. Church. These prints are unquestionably trial proofs, as, aside from possessing a characteristic brilliance and sharpness, they show certain discrepancies and interesting errors in the lettering which render these particular copies unfit for use in the published work and made it imperative that the engravings be immediately corrected.

It will be noted in the accompanying reproduction of the proof from the American Crow plate that the scientific name of the bird, *Corvus americanus*, is repeated after the words, "Black Walnut". In correcting this error by substituting the scientific name of the tree, *Juglans nigra*, it was found necessary to reëngrave the words Black Walnut, so that the entire line might conform to the altered display. Unfortunately some pencil notations on this print had been erased before it came into the writer's hands. These may have been made by Havell himself, as his fragmentary working proofs are so marked. In the lower right hand corner, whether referring to the predominate color note to be used in this plate or not, is plainly discernible the word "Black." A reproduction is also given of a colored print from this plate taken from a published set to show, as much as it is possible to show in a greatly reduced reproduction by the half-tone process, the qualities referred to above.

¹ Plate LVI	Red-shouldered Hawk.	Plate CCCI	Canvas Backed Duck.
" CXXXII	Three-toed Woodpecker.	" CCCII	Dusky Duck.
" CLVI	American Crow.	" CCCXX	Little Sandpiper.
" CCXVII	Louisiana Heron.	" CCCXCII	Louisiana Hawk.

Some critics have objected to a certain flatness in Audubon's drawings, but it is evident from a comparison of the two accompanying illustrations that a degree of the depth or rotundity attained in these plates by the engraver has perhaps been lost by the application of the flat color washes.

The method employed by Havell in executing his plates was that known as aquatinting, a very difficult, complicated, and tedious process. That he was thoroughly at home in this medium of expression and was excelled by but few, if any, aquatinters of his day is shown by the universal commendation of his work by competent art critics. The term "aquatint" refers of course to the biting of the copper plate with aqua-fortis, and not to the coloring of the print with water-color washes. Whatever of brilliance a print might possess, by virtue of the mastery of the engraver's technique, or whatever of freshness it might exhibit by being a first printing from a soft and rapidly deteriorating plate, is obviously more manifest in a proof fresh pulled and uncolored. And these are just the qualities that impart to the Havell proofs their chief charm — they recall Havell rather more than they do Audubon. Long familiarity with the published work does not prepare one for the impression conveyed by a first view of these proofs. The prodigious amount of work underlying the color and the amazing dexterity of the hand that accomplished it is revealed. It is like a look behind the scenes, a familiar glimpse that brings home the personal side of the great enterprise. A thrill of intimacy is experienced. Here, on a full sized, untrimmed sheet of the finest water-color paper made, is a trial impression from the lately completed engraving, once handled and closely inspected for defects and errors, as well as for improvements in style, by the be-aproned and acid stained Havell, and later owned and cherished by the gallant and demonstrative Audubon. A great relic! — perhaps unique. A magnificent example of a practically lost art.



American Crow

FROM THE UNCOLORED PLATE.

THE BREEDING OF THE MIGRANT SHRIKE AT
HATLEY, STANSTEAD COUNTY, QUEBEC, 1916.¹

BY H. MOUSLEY.

THE Migrant Shrike (*Lanius ludovicianus migrans*) like the Prairie Horned Lark is an interesting species, and one which has increased in numbers ever since the clearing of the country, having invaded the eastern side of the continent principally, I suppose, from the Mississippi Valley. As to the exact date of its first breeding here, I cannot say, but some idea may be formed when we consider that it was first recorded as doing so in Maine in 1877, and in Vermont the same year, the latter state adjoining the County of Stanstead on the south, and the former not being more than thirty miles distant on the east at its nearest point.

As already indicated in my 'Five years notes and observations on the birds of Hatley' (Auk, Vol. XXXIII, 1916, pp. 57-73, 168-186), the species is by no means plentiful here, and until the present year I had only been able to locate two nests, and these some three miles or more away from Hatley. However, during the present year I have been fortunate in finding a pair breeding within half a mile south of Hatley Village, and under circumstances which I think are well worth recording. Now my previous earliest date of arrival here for the species was April 13, but on March 28 of the present year I saw an example quite close to my house, but it was not until towards the end of April that my youngest son reported having seen another on two or three occasions near the village and always about in the same locality. This set me thinking, and knowing the ways of shrikes I came to the conclusion that probably it was nesting not far off. With this in view I set off to inspect the locality on April 29, and soon found a shrike perched on the telephone wire, near a tall fir tree (the lower

¹ Read before the Nuttall Ornithological Club, Oct. 2, 1916, by Dr. Chas. W. Townsend for the Author.

branches of which had been cut off) which stood at the side of the road leading from Hatley to Stanstead village. There were a number of thorn and apple trees (the favorite nesting sites of these birds) scattered about over a rather large area, so I proceeded to examine each one carefully, but not a sign of a nest could I discover, or could I find the shrike again; and as it was about noon I returned home, deciding to visit the locality later on in the afternoon. On arrival, however, at the place no signs could be seen of any shrike, but on ascending some rising ground near the tall fir tree already mentioned, I put one up off the ground, and at once decided to follow it wherever it went. It was not long before this one was joined by another, and a pretty dance the pair led me the whole of that afternoon, further and further away from the site of the tall fir tree near which I had put the first bird up, so that at last I had to give up the game in disgust and return home. That they were nesting I felt sure and I got some little encouragement when on one occasion the female tried to dislodge several pieces of coarse grass that had got wedged in some brushwood, but failing to do so she finally desisted. However, to make up for it I got an insight into the affection of these birds for one another, for never on the whole of that afternoon were they very far apart, and on several occasions I saw the male feed his mate with what he no doubt considered some extra tid-bit. There was no chasing of any small birds or the spiking on thorns of the food they obtained (which was always off the ground, and consisted no doubt of beetles, grasshoppers and the like), everything was eaten. On my return home I was thoroughly puzzled, as I had examined every tree in the neighborhood except one, that tall fir tree! But there, I said to myself, shrikes do not usually nest in fir trees, and if they do, it would have to be above the average height in this particular one, as all the lower branches had been cut off as already mentioned. With this I went through all my text books, with the same result, every author except two giving apple trees or thorn bushes as the favorite site for the nest and the elevation a low one, usually from four to ten feet above the ground. The two exceptions mentioned above were Harold H. Bailey who in his 'The Birds of Virginia' 1913, p. 268, says from ten to thirty feet up, but gives no specific instance of a nest having

been found at such an extraordinary height as thirty feet; the other author being the late Ora W. Knight, who in his 'Birds of Maine' 1908, p. 471, gives a specific instance of a nest having been found near Bangor in May, 1896, in the forks of a balsam fir tree sixteen feet from the ground. After reading these two accounts the whole thing seemed to become perfectly clear, and I could see the nest in my mind's eye in that solitary fir tree by the roadside and at a great elevation too, and that no doubt was the reason why the birds kept leading me away from it in the afternoon. On the following morning I visited the site again and secreting myself, had the satisfaction, after waiting half an hour, of seeing one of the birds with building material enter a dense portion of the fir tree very near the top. This was on April 30, but it was not until May 10 that I climbed to the nest (which could not be seen from the ground) and found the female sitting on a set of five eggs, in a most beautiful and symmetrical nest, which was built in some forks close to the trunk, and at the record height of thirty-four feet above the ground. The foundation of the nest consisted of fir twigs, rootlets, string and that favorite material of most birds here, the stalks and flower heads of the pearly everlasting. The lining was formed of wool, plant down, and a good supply of feathers, and the dimensions were as follows, viz.: outside diameter 6, inside $2\frac{3}{4}$ inches; outside depth $4\frac{1}{2}$, inside $2\frac{1}{4}$ inches.

The eggs were finely and evenly spotted all over, the average size being $1.02 \times .73$, and these I took, more especially as I wanted to try and solve the problem as to why the birds had selected this abnormal site. Was it hereditary, or merely a case of environment? If the former, then the birds at their second venture ought by rights to select some equally high elevation, not necessarily in a fir, but in some other tree; but if the latter was the case then one of the apple trees or bushes close at hand ought to be used, as birds seldom or never build again in the same tree, directly after being robbed of their first set of eggs, and therefore would not make use of the fir tree again. Now it must be borne in mind that at the time of nesting the apple trees and bushes were not in leaf, but by accident in the midst of them there stood this solitary fir with excellent cover. Is it not reasonable then to suppose that the birds seeing this, took advantage of their environment, and

built in that fir in preference to the exposed and leafless apple trees and bushes?

At all events, this was the view I took of the matter at the time, and I think that after events will show that perhaps I may not have been so very far wrong. On the day following the taking of the eggs, I left home as I thought for about a week, but owing to unforeseen circumstances it was not until June 29 that I was able to visit the spot again, when on walking to the village of Hatley, and after having just passed the tall fir on the roadside, I heard a great commotion in some bushes and young trees not far off, and there sure enough were the five young Shrikes of the second brood, being fed by their parents, and just able to fly nicely. It took me only a few minutes to locate the nest in an apple tree eight feet up, and only eighty-five yards distant from the site of the first nest in the fir. And so matters had worked out as I had expected, and the birds had reverted to a natural elevation and site, which I feel sure would have been the case in the first instance, if it had not been for the excellent cover afforded by that accidental fir tree being on the ground that the birds had selected as eminently suitable for affording them their necessary food supply.

LABRADOR CHICKADEE (*PENTHESTES HUDSONICUS NIGRICANS*) IN ITS RETURN FLIGHT FROM THE FALL MIGRATION OF 1916.

BY HORACE W. WRIGHT.

THE extraordinary southward migration of *Penthestes hudsonicus nigricans* into New England and still farther south in the fall of 1916 was described with some detail in the issue of 'The Auk' for April, 1917. Almost all the individuals which had been noted in the vicinity of Boston had passed on by the middle of January. Mr. H. L. Barrett, however, recorded four remaining birds in the conifers of the Arnold Arboretum in the months of February, March, and April, his latest observation of these birds having been on April 19. Presumably, therefore, these four birds became winter residents, remaining from a flock of twelve birds noted in December. Other March records of *P. hudsonicus*, which have been furnished me, are those of one bird heard at Ipswich by Dr. C. W. Townsend and Dr. A. A. Allen on March 11, which was so elusive that by their best endeavors they were unable to get a glimpse of it; and one bird taken at Providence, R. I., by Mr. Harry S. Hathaway on March 18. This bird was sent to Dr. Townsend for identification and proved to be *nigricans*.

Some few, but definite data of the return flight of '*hudsonicus*' were obtained in May, when other northern breeding birds were appearing, such as Crossbill, Red-breasted Nuthatch, and northern nesting warblers. On May 4, as I passed through the centre of Belmont, the characteristic calls of two brown-capped Chickadees answering one another were heard in conifers on private grounds bordering the village street. I was not able to obtain a view of these birds, but their presence in trees of the village indicated that they were migrating. Again, on May 14, when I was in the Fresh Pond Reservation in Cambridge, four brown-capped Chickadees were seen in the deciduous trees of that portion known as Kingsley Park, occasionally flying out over the pond, but returning successively to the trees and giving their characteristic calls. These birds were in comparatively open park lands entirely removed

from such haunts as '*hudsonicus*' lives in and were without question migrating. While I was not able to ascertain the subspecific type in either of these cases, the presumption is that it was *nigricans*, since that was the type present in the fall and winter, as ascertained by Dr. Townsend,¹ which appeared in some abundance and moved on southward to Long Island, Staten Island, and New Jersey.

Mr. H. H. Cleaves writes me that one of the four Staten Island Labrador Chickadees learned to eat from one of his cocoanut feeders before starting north, the other three birds having left early, some time in January or early February.

Other May records of '*hudsonicus*' furnished me were these: two birds seen by Mr. Harold S. King with three Black-capped Chickadees at Waverley on May 6 [Townsend]; two birds seen in the Arnold Arboretum by H. L. Barrett on May 13; one bird seen by Mr. Francis H. Allen on his place at West Roxbury on May 18; one heard at Woodstock, Vermont, by Mr. Richard M. Marble on May 14. Mr. Allen writes, "I followed it [*hudsonicus*] about for some time, getting plenty of views of it, but none where I could compare the crown with the back to determine the subspecies. I had heard the bird — or another of the same kind — a few days before, but had not seen it." And Mr. Marble informs me that the lunch-counter-feeding brown-capped Chickadee at Woodstock, mention of which was made in my paper on Labrador Chickadee in 'The Auk' for April, 1917, a typical *littoralis*, disappeared about the first of April. So the May bird observed by him was presumably a migrant.

Mr. H. Mousley of Hatley, Province of Quebec, through Dr. Townsend furnishes exact testimony as to the subspecific type of the migrant birds found there. Dr. Townsend received two Labrador Chickadees in the flesh from Mr. Mousley taken by the latter at Hatley on May 14. Later he received another specimen of *nigricans* taken at the same place by Mr. Mousley on May 16. Dr. Townsend writes me, "On May 21 Mr. Mousley took three more 'typical *nigricans*' which he sent to the Victoria Memorial Museum at Ottawa." And subsequently Dr. Townsend wrote me, "Mr. Mousley took another ♂ *nigricans* at Hatley on May 30."

¹ Auk, vol. XXXIV, April, 1917, p. 160.

Mr. Mousley thus writes Dr. Townsend under date of May 28, 1917, "I have to-day heard from Ottawa that the three Labrador Chickadees have turned out to be one male and two females, so out of my six examples half are ♂'s and half ♀'s. I saw one more example on Sunday the 27th by "itself." This fact of sex equality in number leads Dr. Townsend to remark, "This would look as if the birds were paired and travelling together. I found the organs considerably enlarged."

The definite determination of the subspecific type of *hudsonicus*, taken at Hatley, P. Q., from the middle to the end of May, namely, as Labrador (*nigricans*), without variation, furnishes a fair basis for the presumption that the birds seen about Boston earlier in May, from the fourth to the eighteenth, were of the same subspecific type, and, appearing after an interval of absence, were individuals of the large fall migration of 1916 on their return flight north at the time of the migratory flight of other northern nesting birds. For such a succession of records of '*hudsonicus*' in May in this region, I think, has never been paralleled in the past. When *P. h. littoralis* has appeared, which has been quite infrequently, in the passing years, so far as records show, only a bird or two had been occasionally seen in the autumn until the migration of 1913, which was unprecedented.¹ Whether that was essentially a migration of *P. h. littoralis* or *nigricans* remains somewhat in doubt. Dr. Townsend has identified the bird taken by Mr. J. L. Peters at Harvard, Mass., on November 5, 1913, as a male of the *nigricans* type, and on the other hand one of the nine or more Belmont birds, taken on November 20, 1913, now in the Museum of Comparative Zoölogy, at Cambridge, as a female of the *littoralis* type. It was assumed at the time my paper was written to be a flight of *P. h. littoralis*, for the type *P. h. nigricans* had not then been established. But Dr. Townsend has now rendered the service of determining that the migration of 1916 was essentially that of *P. h. nigricans*. Since there was no similar May migration in 1914, following the large fall migration of '*hudsonicus*' in 1913, the birds disappearing by January or early February, may it be a fair assumption that the birds of the 1913 migration were for the most part of the more

¹ Auk, vol. XXXI, April, 1914, p. 236.

southern type *littoralis*, Acadian, while the late returning northward birds of the present season from the fall migration of 1916, as being farther north residents, would naturally be the Labrador birds, the *nigricans* type?

THE BIRDS OF WALLA WALLA AND COLUMBIA COUNTIES, SOUTHEASTERN WASHINGTON.¹

BY LEE RAYMOND DICE.

THE first definite knowledge of the vertebrate fauna of southeastern Washington was secured by J. K. Townsend (1839) and Thomas Nuttall, who, accompanying a trading expedition across the continent, reached, on September 3, 1834, the Hudson's Bay Company's post of Fort Walla Walla, situated on the Columbia River at the present site of Wallula. They remained here only a few days when they proceeded down the river to Astoria. The following year Townsend returned to Fort Walla Walla and remained in that region from July 6 until September 3.

In 1857 the United States government established Fort Walla Walla as an army post at the present site of Walla Walla. This is more than fifty miles from the former Hudson's Bay Company's post of the same name, and the fauna and flora of the two regions are somewhat dissimilar. Some uncertainty in scientific literature has been caused by the confusion of these two places.

Capt. Chas. Bendire was stationed at Walla Walla for several years, being there at least from August, 1879, until some time in 1881.

Belding (1890) has published a considerable number of brief notes from Walla Walla on birds observed by a person variously quoted as Dr. Williams, J. W. Williams, and once as D. T. Williams. These references probably refer to the same individual. From the

¹ Contribution from the Zoölogical Laboratory, Kansas State Agricultural College, No. 16.

notes given, this person must have studied the birds of the region during a period lasting at least from August, 1884, until the summer of 1885.

During the summer of 1903 a party from the State College, headed by R. E. Snodgrass, crossed the region. They entered at Wallula, proceeded to Walla Walla, then to Bolles, and up the Touchet River to Dayton. From Dayton they proceeded across the Blue Mountains toward Almota (Snodgrass, 1904).

W. Leon Dawson spent several weeks in April and May, 1907, studying the birds near Wallula.

It is known that collectors of the U. S. Biological Survey have worked at several points in the region, but no account of their work has been published, except isolated references to certain localities in taxonomical work.

Storrs H. Lyman of Dayton, Washington, who has made many observations on the birds of Walla Walla and Columbia counties, has kindly allowed the insertion of his notes into the present paper.

Through the courtesy of Dr. H. S. Brode, notes have been secured on the specimens in the collection of Whitman College.

Observations on the birds of this region were begun by the author in December, 1904, and, broken by numerous absences, continued until December, 1915. The vicinity along the Touchet River just east of Prescott has received much the largest share of attention, though field trips, often of several week's duration, have been made to other parts of the region. Specimens have been secured of a large number of the species, and care has been taken to have the taxonomic determinations as nearly correct as possible.

The general topographic features, climate, and habitats of Walla Walla and Columbia counties have been described in an earlier paper by the author (Dice, 1916, 293-332). Western Walla Walla County is dominated by semi-arid sagebrush plains; eastern Walla Walla County and western Columbia County are characterized by high rolling bunchgrass prairie; and in southeastern Columbia County the Blue Mountains are covered by coniferous forests. The wide range of climatic conditions is reflected in the vertebrate life of the different faunal areas.

In the accompanying list an attempt has been made to give the local distribution of each species, so far as known in the region;

and any new information at hand on habits has been included. The list is known to be very incomplete, especially in regard to the bird life of the Blue Mountains and of the sagebrush areas of western Walla Walla County.

***Æchmophorus occidentalis*.** WESTERN GREBE.—A juvenile was taken near Walla Walla a few years ago by S. H. Lyman.

***Mergus americanus*.** MERGANSER.—In early March, 1914, Mr. Bethel Randall took a young male from a small flock swimming in the Touchet River two miles east of Prescott.

***Anas platyrhynchos*.** MALLARD.—Numerous small flocks were observed along the Touchet River and in the grain and stubble fields of the valley near Prescott during late December, 1906. A male was noted Nov. 16, 1915, on the river.

***Mareca americana*.** BALDPATE.—Five were noted on a pool of the Touchet River two miles east of Prescott, Oct. 20, 1915.

***Nettion carolinense*.** GREEN-WINGED TEAL.—Irregularly present, during the winter, in small flocks along the Touchet River near Prescott.

***Spatula clypeata*.** SHOVELLER.—In 1915 a small flock was noted Aug. 23 on a gravel bar of the Touchet River two miles east of Prescott. Another flock of eleven was seen on the river Oct. 21.

***Charitonetta albeola*.** BUFFLE-HEAD.—Five were observed on the Touchet River two miles east of Prescott on Oct. 23, 1915.

***Olor columbianus*.** WHISTLING SWAN.—A mounted specimen at Whitman College is from the Walla Walla River near the Oregon line.

***Botaurus lentiginosus*.** BITTERN.—A specimen in the Whitman College collection was taken near Walla Walla on Nov. 18, 1901.

***Ardea herodias treganzai*.** TREGANZA'S BLUE HERON.—Occasional throughout the year along the shores of the Touchet River near Prescott. They sometimes alight in the upper branches of trees, and in winter are found also in the meadows and open grain fields of the valley.

***Grus mexicana*.** SANDHILL CRANE.—Rare in summer along the shores of the Touchet River near Prescott. Several large migrating flocks of cranes, probably of this species, were seen on April 14, 1908. They were flying very high and were going directly northward.

***Fulica americana*.** COOT.—On Aug. 14, 1914, one was seen on a small seepage lake near Attalia. They are reported by hunters to occur in the fall along the Touchet River near Prescott. Oct. 13, 1915, one was taken by Mr. Geo. Gross from a hawk in the Blue Mountains on the South Fork of the Touchet River.

***Gallinago delicata*.** WILSON'S SNIBE.—Reported by S. H. Lyman as sometimes common along Mill Creek near Walla Walla. A specimen from that locality is in the museum of Whitman College.

***Pisobia bairdi*.** BAIRD'S SANDPIPER.—Early in April, 1908, S. H. Lyman secured two from a small flock feeding in a grain field near Dayton (Dice, 1915, 60).

Totanus melanoleucus. GREATER YELLOW-LEGS.—Reported by S. H. Lyman to have been taken along the Touchet River at Dayton.

Bartramia longicauda. UPLAND PLOVER.—Dawson (1908, 484) heard Upland Plovers in April, 1905, near Two Rivers, western Walla Walla County.

Actitis macularia. SPOTTED SANDPIPER.—Often seen in summer on the bars of the Touchet River near Prescott. One was seen on the rocky shore of Snake River at Lyon's Ferry on June 23, 1914.

Spring arrival records for Prescott are: May 2, 1905; May 22, 1913; and May 19, 1914.

Numenius americanus. LONG-BILLED CURLEW.—Occasionally breeding in the bunchgrass hills near Prescott. They are rapidly decreasing in numbers, as the spring plowing practiced in connection with wheat growing destroys many of their nests, and only a small amount of uncultivated land, on which they can breed, still remains in the region. In spring they often feed about small pools of water in the prairie, but they seldom go near the river during their stay with us. They leave the region soon after the young are able to fly and thus escape the dry summer. Nesting occurs in the latter part of April and the early part of May.

Spring arrival dates at Prescott are: March 23, 1905; March 29, 1906; April 7, 1908; and April 9, 1913.

Charadrius dominicus dominicus. GOLDEN PLOVER.—Taken by Bendire at Walla Walla (Brewster, 1882, 227).

Oxyechus vociferus vociferus. KILLDEER.—Numerous along the shores of the Walla Walla River near Wallula in the early part of June, 1914. They also fed in the sagebrush, sometimes a half mile from the river. Killdeers are fairly numerous in summer along the shores of the Touchet River near Prescott. They often feed in the cultivated meadows of the valley, and at times, especially in the spring, may be found in the grain fields and bunchgrass areas a short distance from the river.

During late December, 1908, several were noted near Prescott and one was taken on Jan. 1, 1909. Spring arrival dates for other years are: Feb. 26, 1905; Feb. 22, 1906; and Feb. 25, 1908.

Perdix perdix. HUNGARIAN PARTRIDGE.—In the early spring of 1915 several were liberated in the Touchet Valley near Prescott. A flock of ten was seen in a field of the valley near some willows on Nov. 20. They had been introduced into Columbia County several years earlier.

Colinus virginianus virginianus. BOB-WHITE.—Introduced. A few were seen in early June, 1914, at the edge of the willows along the Walla Walla River near Wallula. At Prescott they have become common in the brush and timber. At times they feed in the meadows and even a short distance out into the open parts of the valley, but are never found far from cover.

Nests have been noted at Prescott as follows: June 5, 1908, 14 eggs; June 8, 1908, 10 eggs; July 1, 1910, 20 eggs; June 5, 1913, 19 eggs at the point of hatching. These nests were placed in grass at the edge of meadows or in brushy places.

Dendragapus obscurus richardsoni. RICHARDSON'S GROUSE.—A specimen from the Blue Mountains is in the collection of Whitman College. In late July, 1914, they were noted at Hompeg Falls in yellow pine, in western larch, in Douglas spruce, and in lowland fir, being most common in the Douglas spruce. On July 27 a flock was seen in alpine fir on a ridge near Twin Buttes Ranger Station, and others were seen in Douglas spruce on other parts of the same ridge. Several were seen on August 6 beside Butte Creek.

Bonasa umbellus togata. CANADIAN RUFFED GROUSE.—Rather rare near Prescott, and found only in the densest timber and brush. One was seen July 26, 1914, in lowland fir forest at Hompeg Falls.

On June 13, 1908, a hen with a brood of small young was discovered in thick brush two miles east of Prescott.

Pediocetes phasianellus columbianus. COLUMBIAN SHARP-TAILED GROUSE.—Reported by Townsend (1839) from near Wallula. A number were seen June 17, 1914, in the grain fields and in the bunchgrass areas near Eureka. They were formerly abundant in the bunchgrass hills near Prescott, but spring plowing destroys many of their nests and this in connection with extensive hunting has greatly reduced their numbers. They sometimes feed on the buds of the trees along the stream in winter, but are very seldom seen near timber in the summer.

A nest found in a stubble field near Prescott on May 9, 1906, was merely a slight depression in the ground lined with a little straw and a few feathers. It contained 12 eggs. Young only a few days old were seen on May 14, 1914. Quarter-grown young were seen on June 30. In many cases the mother will feign injury in an attempt to lead an enemy away from the vicinity of the chicks. In one case the mother made a series of motions and calls tending to direct the attention to herself and away from the chicks. The young hide in the grass, and may sneak away a considerable distance. They are very hard to find unless they give their calls, and this they rarely do until the hen begins to call them.

Centrocercus urophasianus. SAGE HEN.—Snodgrass (1904, 227) reported the sage hen to "occur throughout the entire sagebrush area of central Washington."

Phasianus torquatus. RING-NECKED PHEASANT.—Introduced into southeastern Washington. They are reported from time to time in the timber along the Touchet River above Prescott. One was seen Aug. 13, 1914, in a grain field near Walla Walla.

Zenaidura macroura marginella. WESTERN MOURNING DOVE.—Near Wallula several were seen in early June, 1914, at the edge of the willows along the Walla Walla River, and a few were noted in sagebrush, some being nearly a mile from the river. They are common during the summer in partially open places in the Touchet Valley near Prescott, and nest in bushes and trees along the river. They feed mostly on the ground at the edge of timber, but may sometimes be found several miles from trees or water. At Lyon's Ferry a few were seen in late June, 1914, about the

rock cliffs overlooking Snake River. They are common in summer at Walla Walla (Belding, 1890, 23).

Spring arrival dates at Prescott are: April 30, 1905; April 2, 1906; March 24, 1908; and April 24, 1913. Five were seen at Prescott on Dec. 25, 1908, so an occasional winter must be spent at that locality.

Cathartes aura septentrionalis. TURKEY VULTURE.—A flock of twelve were seen Aug. 31, 1915, by Carl Dice on a hill east of Prescott. On Sept. 5, he saw another in the trees of the valley. S. H. Lyman reports them from the Blue Mountains.

Accipiter velox. SHARP-SHINNED HAWK.—Common in the timber along the Touchet River at Prescott and Dayton. Dates of capture at Prescott are Jan. 1, 1905; Dec. 21, 1908; Oct. 24, 1915; and Nov. 13, 1915.

Accipiter cooperi. COOPER'S HAWK.—One was shot Sept. 13, 1915, in the timber along the Touchet River near Prescott. S. H. Lyman reports them to be common near Dayton.

Astur atricapillus striatulus. WESTERN GOSHAWK.—Specimens have been taken at Walla Walla (Brewster, 1882, 232). One was shot Sept. 13, 1915, in the timber just east of Prescott while feeding on a young Bob-white. Bendire (1892, 199) says they are pretty generally distributed throughout the Blue Mountains of Oregon and Washington.

Buteo borealis calurus. WESTERN RED-TAIL.—Common over the whole of southeastern Washington. In the region near Prescott they occur throughout the year, but are more common in summer than in winter. They are found in the bunchgrass hills and also in the timber along the streams. In the summer of 1914 a number were seen on the ridges of the Blue Mountains.

On June 20-24, 1914, several pairs were seen about the lava cliffs beside Snake River at Lyon's Ferry. High on one of the cliffs a nest containing two well grown young was observed.

A pocket gopher (*Thomomys columbianus*) was found in the stomach of one taken near Prescott on Dec. 22, 1905.

Buteo swainsoni. SWAINSON'S HAWK.—Occasionally seen in summer near Prescott, in the bunchgrass hills, in the timber of the valleys, and in irrigated meadows. During the latter part of August, 1915, flocks of one hundred or more were observed soaring over the valley in the evenings. One was taken as late as Oct. 16.

Archibuteo lagopus sancti-johannis. AMERICAN ROUGH-LEG.—Taken near Walla Walla by Bendire (Brewster, 1882, 227).

Archibuteo ferrugineus. FERRUGINOUS ROUGH-LEG. — Several rough-legs were seen on June 17, 1914, in the bunchgrass hills near Nine-mile. Another was seen June 25 in the bunchgrass hills about fifteen miles north of Prescott.

Aquila chrysaëtos. GOLDEN EAGLE.—Reported by S. H. Lyman to occur commonly in Columbia County. A mounted specimen from that county is in the museum of Whitman College.

Falco mexicanus. PRAIRIE FALCON.—Reported by Dawson and

Bolles (1909, 525), from the canyon of Snake River and from the gorge of the Columbia below Wallula. Bendire (1892, 289-290) found them somewhat common in timber and prairie at Walla Walla in late summer, fall, and spring, and rarely in winter. During the late fall of 1915, up until Nov. 7, one was often noted on power line poles in an open field east of Prescott.

Falco columbarius columbarius. PIGEON HAWK.—Those taken at Walla Walla have been referred to three different subspecies (Bendire, 1892, 303). However, it seems better to place them all under one subspecies until the taxonomy of the group is better known.

They were of "not uncommon" occurrence at Walla Walla in the winter of 1880-1881 (Allen, 1881, 128).

Falco sparverius sparverius. SPARROW HAWK.—Generally distributed throughout southeastern Washington. One was killed on June 17, 1914, in sagebrush near Wallula not far from the Walla Walla River. In the prairie area they are common in the timber along the streams, but they often hunt in the bunchgrass hills, being found sometimes several miles from timber. At Lyon's Ferry several pairs were seen in late June, 1914, about basaltic cliffs. A number were seen in late July, 1914, on the open rocky slopes and in open yellow pine timber near Hompeg Falls. One was killed August 9, in open Douglas spruce timber on top of a mountain ridge.

Several remained throughout the winter of 1905-06 in the Touchet Valley near Prescott. Spring arrival dates for other years are: April 3, 1908; and April 9, 1913.

A nest was found, April 23, 1906, in an old magpie nest about twelve feet high in an osage hedge two miles east of Prescott. There were no eggs at that time, but later five were laid. During early June, 1908, another pair nested in a deserted magpie nest. At other times Sparrow Hawks were seen to enter and leave old woodpecker holes high in the cottonwood trees, and they evidently nested there.

Pandion haliaëtus carolinensis. OSPREY.—S. H. Lyman reports the killing of one beside the Touchet River in the city of Dayton. On May 17, 1913, one was perched in a high tree overlooking the Touchet River near Prescott. At this place one was killed on Sept. 21, 1915.

Asio wilsonianus. LONG-EARED OWL.—A few live throughout the year in the timber along the streams of Walla Walla County. None are found except in heavy brush or timber.

A nest in a broken-down magpie nest twelve feet above the ground, was found in 1906 in thick brush along the Touchet River near Prescott. No eggs had been laid on April 23, but on April 27 the nest contained two. On April 24, 1908, another Long-eared Owl was seen on a deserted magpie nest thirty feet above the ground. Dawson (1914, 56-57) reports finding a nest near Wallula.

Asio flammeus. SHORT-EARED OWL.—On June 13, 1914, one was flushed from the ground in sagebrush near Wallula. He sailed off and

alighted on a hill covered by bunchgrass. Near Prescott they have been seen a few times in the bunchgrass hills. Specimens were taken by Bendire at Walla Walla (Brewster, 1882, 229). S. H. Lyman has noted the species in both Walla Walla and Columbia Counties.

Scotiaptex nebulosa nebulosa. GREAT GRAY OWL.—A specimen taken in Columbia County 15 or 20 miles east of Dayton was brought to S. H. Lyman early in December, 1914.

Cryptoglaux acadica acadica. SAW-WHET OWL.—One was taken Nov. 19, 1915, in timber two miles east of Prescott. S. H. Lyman has heard their call notes a number of times in the Blue Mountains. Early in December, 1914, he took a specimen at an old barn on the outskirts of Dayton.

Otus asio macfarlanei. MACFARLANE'S SCREECH OWL.—Noted at Wallula (Dawson and Bolles, 1909, 475). Breeding at Walla Walla (Bendire, 1892, 372). They occur commonly throughout the year in the timber along the Touchet River at Prescott. In late July, 1914, a family party, of which the young were nearly grown, inhabited the lowland fir forest near Hompeg Falls.

Bubo virginianus lagophonus. NORTHWESTERN HORNED OWL.—Type (Oberholser, 1904, 185-187) from Walla Walla, taken on Nov. 13, 1881. Oberholser states (p. 186) that in this form, so far as shown by the material at hand, there is no indication of a pale phase. Of 18 specimens taken by Bendire (1892, 388) at Walla Walla 12 were dark in color and were referred to *B. v. saturatus*, 3 were intermediate, and 3 being light in color were referred to *B. v. subarcticus* (Hoy). *B. v. saturatus* as given by Bendire (1892, 383) is evidently a synonym of *lagophonus* (Ridgway, 1914, 748). It seems that as *lagophonus* does not have a pale phase, two forms of horned owl must occur at Walla Walla.

Bendire (p. 388) reports *saturatus* (*lagophonus*) common near Walla Walla in winter, but states that they were not seen after the approach of spring. In some winters horned owls are numerous in the timber along the Touchet River near Prescott.

Bubo virginianus occidentalis. WESTERN HORNED OWL.—The horned owl breeding at Walla Walla is given by Bendire (1892, 388) as *B. v. subarcticus*. This name is given by Ridgway (1914, 744) as a synonym in part of *occidentalis*, and this must be the subspecies breeding in Walla Walla County.

Near Prescott horned owls are rarely seen in summer. Throughout the year they keep to the heavy brush and timber along the rivers.

Nyctea nyctea. SNOWY OWL.—Bendire (1892, 390) took two Snowy Owls at Walla Walla in winter. S. H. Lyman reports that he has seen the species near Dayton in very cold weather.

Speotyto cunicularia hypogæa. BURROWING OWL.—In June, 1914, a pair had a nest in sagebrush beside an irrigating ditch near Wallula. Reported from Walla Walla (Bendire, 1892, 400). Near Prescott they are numerous in summer in the bunchgrass areas.

Spring arrival dates at Prescott are: March 19, 1905; April 3, 1908; and April 11, 1913.

Glaucidium gnoma californicum. CALIFORNIA PYGMY OWL.—Bendire (1888a, 367) took this owl in the Blue Mountains of Washington. S. H. Lyman killed one at an old barn near Dayton in December, 1914. A specimen in the Whitman College collection was taken Feb. 13, 1902, at Dayton.

Streptoceryle alcyon caurina. WESTERN BELTED KINGFISHER.—Numerous in summer along the Touchet River near Prescott. They are often seen perched on trees overlooking the stream. On Aug. 4, 1914, one was seen on Butte Creek in the Blue Mountains. During the winter of 1904-05 several remained near Prescott all winter. In 1913 the first spring arrival was noted on March 31. A nest hole was discovered in the soft dirt banks of the Touchet River near Prescott on May 19, 1914.

Dryobates villosus monticola. ROCKY MOUNTAIN HAIRY WOODPECKER.—Occasional in winter in the trees along the Touchet River near Prescott. In the summer of 1914 a number were seen on the ridges of the Blue Mountains in alpine fir forest and elsewhere on dead trees.

Dryobates pubescens homorus. BATCHELDER'S WOODPECKER.—Numerous throughout the year in the timber along the Touchet River near Prescott. Reported rare at Walla Walla (Bendire, 1895, 59).

On June 11, 1908, a nest containing young was found four feet above the ground in an apple tree near Prescott. The female was seen gathering large, red aphids from nearby golden-rod. She would gather all her mouth could hold and until the aphids stuck out like a fringe all around the edges of the bill. Then she flew in a direct line toward the nest. This female was also seen to gather aphids from apple trees.

Xenopicus albolarvatus. WHITE-HEADED WOODPECKER.—Mr. George Gross shot one in the Blue Mountains late in May, 1909, and sent me the specimen.

Picoides arcticus. ARCTIC THREE-TOED WOODPECKER.—S. H. Lyman secured a male about five years ago in heavy Douglas spruce on a ridge of the Blue Mountains. The specimen is now in his collection.

Picoides americanus subsp. THREE-TOED WOODPECKER.—A white-backed, Three-toed Woodpecker was seen July 31, 1914, in heavy Douglas spruce forest near the top of a ridge near Twin Buttes R. S. S. H. Lyman reports the species to be common in these mountains.

Sphyrapicus varius nuchalis. RED-NAPED SAPSUCKER.—Found sparingly in the Blue Mountains of Washington by Bendire (1888, 226).

Sphyrapicus thyroideus. WILLIAMSON'S SAPSUCKER.—Noted a number of times in the Blue Mountains in the summer of 1914. Near Hompeg Falls they were found in lowland fir in the canyon, and in yellow pine forest on the low ridges. On top of the ridge at Twin Buttes R. S. they were seen in Douglas spruce forest, and on Butte Creek they were found in brush and among cottonwoods.

Phlœotomus pileatus picinus. WESTERN PILEATED WOODPECKER.—Several were reported to have been present for about a month in Sept.—

Oct., 1914, in trees along the Touchet River east of Prescott. Near Hompeg Falls they were noted a few times during July, 1914, in low-land fir forest, and two were seen in western larch forest.

Asyndesmus lewisi. LEWIS'S WOODPECKER.—Abundant in summer near Prescott. They live principally in the timber, but may often be found on fence posts in the bunchgrass and grain fields several miles from trees. None were seen along the Touchet River below Lamar, nor were any seen in the Blue Mountains. Reported breeding at Walla Walla (Bendire, 1895, 120).

Spring arrival dates at Prescott are: April 29, 1905; April 26, 1908; and April 29, 1913. In 1915 the species was last seen on Sept. 18. Several nests containing vociferous young were noted in the early part of June, 1908, high in cottonwood trees near Prescott. On May 21, 1914, a nest was found about twelve feet high in a catalpa.

These woodpeckers are very fond of cherries and may often be seen feeding on the ripe fruit. When cherries are ripe a constant stream of birds may be seen carrying them in their bills to the young in nearby nests.

Colaptes cafer collaris. RED-SHAFTED FLICKER.—A number were seen in early June, 1914, in the willows along the Walla Walla River near Wallula. In the timber along the streams of the prairie area they are common in summer. They often fly considerable distances out into the bunchgrass hills and feed on the ground. On the ridges of the Blue Mountains they were numerous during the summer of 1914 in buckbrush, alpine fir forest, and Douglas spruce forest, being most often noted on dead trees. A few were seen in the deciduous timber along Butte Creek.

A few flickers remain at Prescott during the winter. During the winter of 1908 one roosted every night at a certain place under the porch of a ranch building.

Mating behavior was noticed as early as February 29, in 1905. A nest, about twelve feet high in a catalpa tree, two miles east of Prescott, on May 7, 1908, contained six eggs. This nest had been used by flickers for at least two previous seasons.

Chordeiles virginianus hesperis. PACIFIC NIGHTHAWK.—Common near Wallula in early June, 1914. They were often seen flying over sagebrush and occasionally over the Walla Walla River or over the willows along the stream. They often alight on the ground or on fence posts in the sagebrush. Near Prescott a few have been observed in flight over the bunchgrass hills, over the Touchet River, and over the timber along the stream. At Lyon's Ferry a number were seen in the evenings of late June, 1914, flying over Snake River. In the late summer of 1914 a few were seen flying over Butte Creek and over the highest ridges of the Blue Mountains.

Chætura vauxi. VAUX'S SWIFT.—S. H. Lyman has seen this swift in the region on two occasions, once finding a specimen dead in Dayton.

Archilochus alexandri. BLACK-CHINNED HUMMINGBIRD.—Common summer resident in the timber along the Touchet River near Prescott.

Selasphorus rufus. RUFOUS HUMMINGBIRD.—Numbers occur in the

timber along the Touchet River at Prescott. Two young fully able to fly were noted on Aug. 11, 1915. The species was last seen on Aug. 24.

Stellula calliope. CALLIOPE HUMMINGBIRD.—A juvenile was taken Aug. 6, 1914, in brush along Butte Creek.

Tyrannus tyrannus. EASTERN KINGBIRD.—A few were seen in early June, 1914, in the willows along the Walla Walla River near Wallula. Near Prescott and Walla Walla they are common in summer, but are not so abundant as the western kingbird. They are most abundant at the edges of timber, in orchards, and in the shade trees about isolated farm buildings, but are often found on fence posts in the bunchgrass considerable distance from trees. On Eureka Flat they were numerous in the early part of June, 1914, several miles from the nearest timber.

One nest was found July 13, 1909, and another on June 26, 1914, both on a small bridge over the Touchet River near Prescott. In 1915 they were last noted in this region on Sept. 1.

Tyrannus verticalis. WESTERN KINGBIRD.—In early June, 1914, numerous pairs were observed near Wallula and they were numerous on Eureka Flat. They are abundant in summer near Prescott. They are not usually found in heavy timber, but prefer open woods or places where there are only a few trees. A favorite place is in the shade trees about farm buildings. Sometimes they are found in the bunchgrass hills far away from buildings or trees.

Spring arrival dates at Prescott are: April 30, 1905; April 26, 1908; and April 21, 1913. In 1915 they were last noted on Aug. 22.

On June 12, 1914, one was seen brooding a nest on a hay derrick near Wallula, and remained on the nest even when the derrick was in use. Near Prescott they nest commonly in trees and about barns. On May 7, 1908, a nest in process of construction was found in a locust tree. On May 13, 1908, a completed nest was observed in a barn in the bunchgrass hills southwest of Prescott. June 12, 1914, a nest was seen on a rocky cliff at Lyon's Ferry. In the foothills of the Blue Mountains, southeast of Waitsburg, a nest was noted on a fence post in bunchgrass. They also breed at Walla Walla (Bendire, 1895, 248).

The Western Kingbird is very pugnacious and fearless and will attack any animal which ventures near the nest. In the bunchgrass country, where nesting sites are scarce, they will make use of any sort of a small box nailed up for their use. If they can be induced to nest near a poultry yard, hawks and magpies are effectively kept away.

Sayornis sayus. SAY'S PHOEBE.—Reported from Walla Walla (Bendire, 1895, 277). One was seen June 17, 1914, in bunchgrass on the hills near Nine-mile. They are common in summer in the neighborhood of Prescott. At Lyon's Ferry one was seen June 23, 1914. Their preference is for open country with a few trees, and they are seldom found in heavy timber. Sometimes they are found a mile or more from trees. In the bunchgrass hills they are often found about farm buildings.

March 8, 1905, and March 9, 1908, are spring arrival dates at Prescott,

but these records are probably not of the earliest arrivals, for the Say Phœbe is one of the first birds to arrive in spring.

On May 5, 1908, a nest with four partially fledged young was found inside an old house near Prescott. The nest was placed on a ledge above a closed window. The bird entered the house through an open window and crossed two rooms to reach the nest. On June 19 a second brood was found in this nest. One of the first brood was found dead in the room, but the other three had probably been able to get out through the open window. June 24, 1910, a nest containing young was found in the same building, but in a different room, which the bird entered through an open screen door. On May 16, 1908, a nest was found on a beam in a dirt cellar in the hills near Prescott. All the nests were low and broad and included horse-hairs and bits of cloth in their construction.

Nuttallornis borealis. OLIVE-SIDED FLYCATCHER.—One was collected Sept. 17, 1909, from the top of a high tree near Prescott. Others were seen in an orchard on Aug. 7, and Sept. 5, 1915. A specimen in the Whitman College collection was taken at Dayton on Aug. 24, 1900.

Myiochanes richardsoni richardsoni. WESTERN WOOD PEWEE.—Common in the orchards and timber of the Touchet Valley near Prescott. In 1915 they were last seen on Aug. 27.

Empidonax difficilis difficilis. WESTERN FLYCATCHER.—Reported by Snodgrass (1904, 229) to occur along the Walla Walla River and on the Touchet River. On August 6, 1914, one was shot from a flock of juveniles in heavy brush along Butte Creek in the Blue Mountains.

Empidonax trailli trailli. TRAILL'S FLYCATCHER.—Characteristic of open brush and willow patches in the Touchet Valley east of Prescott. Specimens were taken on June 18, 1908, and June 27, 1914. In 1915 they were still present on Aug. 22.

Empidonax hammondi. HAMMOND'S FLYCATCHER.—A juvenile was taken in lowland fir forest near Hompeg Falls on July 26, 1914.

Empidonax wrighti. WRIGHT'S FLYCATCHER.—A number were seen in the trees beside the Touchet River near Prescott on May 18, 1913, and one specimen taken. In late July, 1914, old and young were numerous in open places of the lowland fir forest at Hompeg Falls. One specimen was taken on July 23, and on July 24 another was taken in brush on the side of the canyon.

(To be concluded.)

A REVISION OF THE RACES OF TOXOSTOMA
REDIVIVUM (GAMBEL).

BY HARRY C. OBERHOLSER.

FOUR forms of *Toxostoma redivivum* have been described, but at present only one is generally recognized. Both Mr. Robert Ridgway and the writer have hitherto failed to distinguish more than a single race, which we have considered coextensive with the species; but this failure now proves to have been due to lack of proper material. Dr. Joseph Grinnell, however, has recently allowed three subspecies in California.¹ The identification of newly collected material in the Biological Survey has led me to a reëxamination of the entire species. For this purpose a very satisfactory number of specimens has been available, altogether 385, including the type and type series of *Toxostoma redivivum sonoma* Grinnell, also the types of *Toxostoma redivivum redivivum*, *Toxostoma redivivum pasadenense*, and *Toxostoma redivivum helvum*. For the use of these and much additional material the writer is under obligation to the authorities of the United States National Museum, the Academy of Natural Sciences of Philadelphia, the American Museum of Natural History, and the Museum of Comparative Zoölogy; to Mr. John E. Thayer, Mr. William Brewster, Mr. A. C. Bent, Dr. Joseph Grinnell, Dr. J. Dwight, and Dr. L. B. Bishop. With these advantages it is now possible to recognize, instead of a single form, three fairly well defined geographic races, which are explained in the following paragraphs:

***Toxostoma redivivum redivivum* (Gambel).**

Harpes rediiva GAMBEL, Proc. Acad. Nat. Sci. Phila., II, No. 10, August, 1845, p. 264 (near Monterey, California).

Harporynchus redivivus pasadenensis GRINNELL, Auk, XV, No. 3, July, 1898, p. 237 (Pasadena, California).

¹ Pacific Coast Avifauna, No. 11, October 21, 1915, pp. 154-155; 'The Auk,' XXXIV, No. 4, October, 1917, pp. 427-433.

CHARS. SUBSP.—Brown of upper parts decidedly grayish; white of throat with little or no tinge of buffy; brown jugular band dark and grayish; buffy ochraceous of posterior lower parts pale.

MEASUREMENTS.—Male:¹ wing, 94–106.5 (average, 100.6) mm.; tail, 117–138 (128.1); exposed culmen, 32–39 (36.2); tarsus, 36.5–40 (38.1); middle toe without claw, 22–26 (24.3).

Female:² wing, 93–105.5 (average, 98.9) mm.; tail, 124–130 (126.9); exposed culmen, 33.5–39 (36.1); tarsus, 35.5–39 (37.2); middle toe without claw, 22.5–25.5 (23.8).

TYPE LOCALITY.—Near Monterey, California.

GEOGRAPHIC DISTRIBUTION.—Central northern Lower California, and southern California excepting the southeastern part and the coast region north of Monterey Bay. Resident in the Upper Austral and to some extent the Lower Austral zones, north to Amador (Amador County) in California, Sacramento, and Grafton (northeastern Yolo County); west to Brentwood (Contra Costa County), Monterey, Santa Barbara, Laguna Beach (Orange County), San Diego, and the Mexican Boundary Line at the Pacific Ocean; south to extreme southwestern San Diego County, Campo, and Cameron Ranch (San Diego County) in California, and Hanson Laguna, Lower California; east to Jacumba (southwestern Imperial County) in California, Palm Springs (Riverside County), Hesperia (San Bernardino County), Piute Mountains (Kern County), Weldon (Kern County), East Fork of Kaweah River about 10 miles west of Mineral King (Tulare County), Fresno Flat (Madera County), Coulterville, and Murphy (Calaveras County).

Remarks.—The subspecific separation of the birds of this species living in southern California from those inhabiting the coast region north of Monterey Bay was first made by Dr. Joseph Grinnell.³ From our present investigations it is evident that this distinction is easily maintainable, although it must be noted that none of the characters are wholly constant, on account of the great amount of individual variation in both races. Birds in juvenal plumage are, furthermore, almost as readily distinguishable as those in the adult stage; the juveniles of the present form being decidedly less ochraceous on the under parts and somewhat less rufescent above than the young of *Toxostoma redivivum sonomae*.

¹ Ten specimens, from California.

² Ten specimens, from California.

³ *Harporhynchus redivivus pasadenensis* Grinnell, Auk, XV, No. 3, July, 1898, p. 237 (Pasadena, California).

Dr. Grinnell, in describing his *Harporhynchus redivivus pasadenensis*, considered that the bird inhabiting the southern side of Monterey Bay, including the type locality of *Toxostoma redivivum redivivum*, was the same as that of the southern shore of San Francisco Bay, and thus, by inclusion of the type, made the northern bird the typical race. A recent careful examination of Gambel's type of *Harpes rediviva*, which is now in the Academy of Natural Sciences at Philadelphia, shows that this arrangement apparently needs revision. This type is an old specimen, which was for a long time mounted and thus exposed to the light, and has consequently become somewhat discolored, particularly on the upper parts. Except for its more brownish upper surface, which is apparently due to this discoloration, it is in all respects readily matched by many of our large series of birds from southern California; and although it shows a slight vergence toward the northern race, its whitish throat, dark breast, and pale under parts leave no doubt of its correct identification with the race from southern California, called by Dr. Grinnell *Harporhynchus redivivus pasadenensis*. This identification of Gambel's type specimen is fortified by a series of adult and young birds from Seaside, California, which is situated on the southeastern shore of Monterey Bay but a short distance east of Monterey. These examples, while showing a slight inclination toward the northern subspecies, are very much nearer the southern form. It is evident, therefore, that the name *Toxostoma redivivum redivivum* must be transferred to the southern race, to displace *Toxostoma redivivum pasadenense* (Grinnell), while another name must be found for the bird now known as *Toxostoma redivivum redivivum*. Adult specimens from Paso Robles, in San Luis Obispo County, and from Jolon, in Monterey County, are also clearly referable to this race, since they are not distinguishable from many southern California specimens. The same remarks are applicable to our juvenal examples from Paraiso Springs in Monterey County. Birds from Chinese in Calaveras County, Brentwood in northeastern Contra Costa County, and Amador in Amador County, vary slightly toward the northern subspecies, *Toxostoma redivivum sonomae*, but belong clearly to the present form. A series of both juvenal and adult birds from Campo, Jacumba, Cameron Ranch, and Pine Valley,

all these localities situated along the Mexican border of southern California, are in characters about half way between *Toxostoma redivivum redivivum* and *Toxostoma redivivum helvum* of Lower California, but on the whole seem to be rather nearer the California race. A single adult in fresh plumage from Chulavista, in southwestern San Diego County, California, and a large series from Witch Creek, California, are more clearly referable here.

One hundred and seventy-five specimens of this race have been examined, from the following localities:

California.—Seaside, Monterey County (June 26, 28, 29, and 30, 1909); Santa Paula (April 8, 1880); Paso Robles, San Luis Obispo County (Sept. 2, 1902); Los Alamos, Santa Barbara County (Nov. 4, 1884); Pasadena (Jan. 15, 1909; Feb. 6, 1897; Sept. 5, 1909; Dec. 26, 1896); Whitewater, Riverside County (Sept. 12, 1907) Jolon, Monterey County (Oct. 4, 1884); San Gabriel Wash, Los Angeles County (Oct. 17, 1915); Heninger Flats, San Gabriel Mountains (July 4 and 8, 1905); San Fernando (Nov. 3 and 13, 1902; Oct. 29, 1915); Placerita Canyon, Los Angeles County (Nov. 28, 1915; Dec. 10, 1915); Stanley, Kings County (June 30, 1907; July 1, 1907); Saticoy (Feb. —, 1872); Chinese, Calaveras County (Sept. 26, 1901); Fullerton, Orange County (Nov. 15, 1900); Amador (April 26, 1896); Brentwood, Contra Costa County (Dec. 21, 1907); Kernville (July 11, 1891); Santa Barbara (Jan. 10, 1875); Fort Tejon; Raymond, Madera County (June 29, 1904); Palm Springs, Riverside County (June 11, 1907); Paraiso Springs, Monterey County (April 16, 1881; July 19, 1902); Grafton, northeastern Yolo County (1877; July 28, 1906); Eshom Valley, Tulare County (August 29, 1907); 4 miles east of Cuyama Ranch, Cuyama Valley, San Luis Obispo County (June 27, 1916); Los Angeles (May 10, 1915); Jacumba, Imperial County (Feb. 9, 1903; May 19, 21, and 22, 1894); Witch Creek, San Diego County (Jan. 7, 1908; Jan. 2, 1907; Jan., 1893; Jan. 14, 1904; Feb. 1, 1904; May 7, 1904; July 22 and 28, 1911; July 14 and 26, 1904; August 1, 2, 4, and 23, 1911; August 8, 10, 18, 19, 22, and 26, 1904; August 9, 1913; August 12 and 20, 1912; Sept. 2, 1911; Sept. 26, 1913; Oct. 11, 12, 13, 17, and 27, 1906; Nov. 20, 1903; Nov. 20, 1906; Nov. 24, 1904; Dec. 13, 1909; Dec. 30, 1904); San Diego (Feb. 5, —; Feb. 18, 1893; March 2, 1894; spring, 1874; April

20, 26, and 28, 1894; May 3, 7, and 17, 1894; Dec. 17, 1884; Dec. 22, 1906); Riverside (Jan. 6, 1887; Jan. 19 and 28, 1888; March 19, 1887; April 5, 1887; May 7 and 8, 1887; Sept. 10, 14, and 28, 1881; Sept. 27, 1888; Oct. 6, 1883); Escondido (June 16, 1897); Sacramento; Santa Ysabel (Dec. 25, 1892); Paicines, San Benito County (June 14, 1903); San Bernardino (March 30, 1882; Jan. 18, 1884; Sept. 10, 1888; April 26, 1882); San Bernardino Valley (Oct. 2 and 6, 1893); San Bernardino County (Dec. 25, 1877); Lankershim, San Fernando Valley, Los Angeles County (Jan. 30, 1917); Los Nogales, San Fernando Valley, Los Angeles County (Feb. 9, 1917; May 16, 1917); Redlands (Feb. 13 and 25, 1903; Jan. 3 and 30, 1903; March 11 and 21, 1903; Nov. 24, 1902; Dec. 29, 1902); Highland Park, Los Angeles County (Jan. 31, 1903); Los Angeles County (Dec. 14, 1906); Tejunga Wash, Los Angeles County (Sept. 10, 1890); Dulzura (March 15, 1894; May 13, 1892; June 3, 1891; June 9, 1890; August 1, 1889; Oct. 15, 1891); Kern County (May 29, 1907); Monterey County (June 12, 1903); Banta, San Joaquin County (May 25, 1896); Ocean Beach, near Mexican Boundary Line, San Diego County (August 17, 1894); Chulavista, San Diego County (Sept. 18, 1916); Campo, San Diego County (Feb. 3, 1903); Cameron Ranch, San Diego County (June 22, 1894); Pine Valley, near Mexican Boundary Line, San Diego County (Aug. 8, 1894).

Lower California.—Hanson Laguna, Hanson Laguna Mountains (June 6, 1905).

***Toxostoma redivivum sonomae* Grinnell.**

Toxostoma redivivum redivivum AUCT. (nec Gambel).

Toxostoma redivivum sonomae GRINNELL, Pacific Coast Avifauna, No. 11, October 21, 1915, p. 155 (one mile west of Guerneville, Sonoma County, California).

CHARS. SUBSP.—Similar to *Toxostoma redivivum redivivum*, but brown of upper parts more rufescent (less grayish); upper throat and chin more washed with buff; jugular band more buffy (less grayish) and not so dark; buffy ochraceous of posterior lower parts darker.

MEASUREMENTS.—Male:¹ wing, 97–107 (average, 103.2) mm.; tail,

¹ Thirteen specimens, from California.

122–140 (132.7); exposed culmen, 32–39.5 (36.2); tarsus, 37–41.5 (39.1); middle toe without claw, 23.5–26.5 (25.0).

Female:¹ wing, 97–103.5 (average, 100) mm.; tail, 125–136 (131.9); exposed culmen, 34–37 (35.2); tarsus, 36–40 (38.1); middle toe without claw, 24–26.5 (25.5).

TYPE LOCALITY.—One mile west of Guerneville, Sonoma County, California.

GEOGRAPHIC DISTRIBUTION.—Northern and central western California. Resident in the Upper Austral Zone and to a slight extent in the Lower Austral Zone, north to Baird (Shasta County), Stillwater (Shasta County), and Covelo (Mendocino County); west to Olinda (Shasta County), Cahto (Mendocino County); Ukiah (Mendocino County); Guerneville (Sonoma County), Freestone (Sonoma County), Marin County, San Francisco, Pescadero, and Santa Cruz; south to Santa Cruz, and in the Sacramento Valley to Marysville Buttes (Sutter County) and Folsom (Sacramento County); east to Los Gatos, San Jose, Berryessa, Santa Clara, Berkeley, Vacaville (Solano County), Rumsey (northwestern Yolo County), Placerville (Eldorado County), Wheatland (Yuba County), Nevada County, and Tehama.

Remarks.—As are all the forms of the species, the present one is subject to much individual variation, and the characters that separate it from *Toxostoma redivivum redivivum* and *Toxostoma redivivum helvum* are, strictly speaking, only average, although it is a race well worthy of recognition. This individual variation shows mostly on the jugulum, abdomen, and upper parts. Very badly worn specimens are sometimes difficult to distinguish from birds of the other races in similar condition. An example from Folsom, Sacramento County, (No. 82575, U. S. Nat. Mus.) is in perfect, fresh, fall plumage, and shows not the slightest indication of intergradation with *Toxostoma redivivum redivivum*.

The thrashers of this species occupying the upper Sacramento Valley and that part of the coast region lying north of San Francisco Bay have been recently separated by Dr. Joseph Grinnell² as a subspecies distinct from those inhabiting the coast region from San Francisco Bay south to Monterey Bay, which, as above noted, he considers true *Toxostoma redivivum redivivum*. With the type series of this additional northern race in hand, together with a

¹ Seven specimens, from California.

² *Toxostoma redivivum sonomæ* Grinnell, Pacific Coast Avifauna, No. 11, October 21, 1915, p. 155 (one mile west of Guerneville, Sonoma County, California).

considerable number of specimens not examined by Dr. Grinnell, I am unable to discover any differences sufficiently constant or distinctive to warrant the recognition of an additional subspecies. It is true that comparison with only Dr. Grinnell's type series indicates the existence of the two forms, although even this is not very satisfactory; but when our series is combined with his it is apparent that there is not sufficient difference in even average characters to maintain the distinction. Not 50 per cent of the specimens from northern California can be separated by the color of the jugulum, flanks or upper parts, or, so far as I can see, by any other character, from those of the coast region south of San Francisco Bay; and while there is a slight average difference in the birds from these two areas, it is due largely to a few very gray examples in the type series, and is really so slight and inconstant as to be worthless for subspecific differentiation. Neither does a series of juvenal specimens of both these supposed races show any differences between them, as should be the case were the distinction tenable. Individual variation among the birds from north of San Francisco Bay is very great, and the most rufescent as well as the most grayish of the entire series, including those from south of this bay, are among the specimens from the north. Our examination is based primarily on birds in freshly moulted condition, as the aspect of the plumage changes greatly by any considerable amount of wear, and it is therefore difficult to predicate subspecific separations on worn birds. Furthermore, there is no satisfactory difference in measurements, as the table of measurements (p. 59) will show.

It is, as thus explained, necessary to unite the birds from north of San Francisco Bay, described by Dr. Grinnell as *Toxostoma redivivum sonomæ*, with the birds from the coast region south of this bay, called by him *Toxostoma redivivum redivivum*. Since, furthermore, the name *Toxostoma redivivum redivivum* is, as above shown, properly applicable to the southern bird heretofore called *Toxostoma redivivum pasadenense*, the name *Toxostoma redivivum sonomæ* Grinnell becomes necessarily the name for the northern subspecies as now defined.

Seventy-three specimens of this race have been examined, from the localities given below:

California.—Palo Alto, Santa Clara County (April 17, 1898;

Locality.	Wing.	Tail.	Exposed culmen.	Tarsus.	Middle toe with-out claw.
Nine males from north of San Francisco Bay.					
Minimum	97.0	122.0	32.0	37.0	23.5
Maximum	106.5	140.0	39.0	41.0	26.5
Average	102.4	132.7	36.2	39.1	25.0
Four males from south of San Francisco Bay.					
Minimum	104.0	127.0	36.0	38.5	25.0
Maximum	107.0	134.0	39.5	41.5	26.5
Average	105.0	129.6	37.0	39.8	25.5
Five females from north of San Francisco Bay.					
Minimum	97.0	128.0	34.0	37.0	24.0
Maximum	103.5	136.0	37.0	40.0	26.5
Average	100.0	133.5	35.4	38.1	25.5
Two females from south of San Francisco Bay.					
Minimum	100.0	125.0	34.5	36.0	25.0
Maximum	100.0	132.5	34.5	38.5	26.0
Average	100.0	128.7	34.5	37.2	25.5

July 15, 1904; June 3, 1898; March 13, 1898; Dec. 31, 1896); Santa Clara (June 25, 1875); San Francisco (winter); Presidio, near San Francisco; Stanford University (June 1, 6, and 8, 1900; Oct. 4, 1897); Round Valley, Mendocino County (Sept. 5, 1899); Stillwater, Shasta County (July 6, 1901); Mount George (August 2, 1909); Mount St. Helena (August 29, 1900); Olinda, Shasta County (Nov. 15, 1900); Calistoga, Napa County (Oct. 16, 1889); Folsom, Sacramento County (Oct., 1875); Baird (Jan. 3, 1884); Rumsey, Yolo County (June 28, 1912); Freestone, Sonoma County (June 14, 1913); One mile west of Guerneville, Sonoma County (August 29 and 30, 1913); Marysville Buttes (3 miles northwest of Sutter, Sutter County) (April 6, 1912); three miles south of Covelo, Mendocino County (July 21, 24, 25, and 26, 1913); near summit of Mount Sanhedrin, Mendocino County (August 17, 1913);

three miles west of Vacaville, Solano County (July 4 and 5, 1912); Berryessa (Jan. 22, 1889; April 11, 1896); Oakland (Feb. 24, 1881); Santa Cruz (July 8, 1896; August 31, 1895; Oct. 19, 1895; Nov. 25, 1895; Dec. 17, 1895); Santa Cruz County (Dec. 14, 1899); Big Trees, Santa Cruz County (May 15 and 18, —); Contra Costa; Berkeley, Alameda County (Feb. 20, 1898; March 22, 1897; April 10, 1897; Nov. 26, 1897); Claremont Canyon, near Berkeley (July 14, 1917); Pescadero (Sept., 1889); Los Gatos (Feb. 14, 1894; Oct. 22, 1894); La Honda, San Mateo County (March 24, 1896); Menlo Park, San Mateo County (Jan., 1896; Dec. 17, 1895); Portola, San Mateo County (Dec. 31, 1895); Cedro Cottage, San Mateo County (Jan. 17, 1903); Black Mountain, Santa Clara County (June 4, 1904; August 29, 1904); Nevada County (Sept. 25, 1887); Snow Mountain, Colusa County (June 3, 4, and 12, 1896).

***Toxostoma redivivum helvum* Thayer and Bangs.**

Toxostoma rediviva helva THAYER AND BANGS, Proc. New Engl. Zool. Club, IV, Apr. 30, 1907, p. 17 (Rosario, Lower California).

CHARS. SUBSP.—Similar to *Toxostoma redivivum redivivum*, but jugular band paler, less grayish (more washed or tinged with buffy); throat more deeply buffy (less whitish); flanks usually more brownish (less grayish); and remaining lower parts somewhat more deeply and brightly ochraceous.

MEASUREMENTS.—Male:¹ wing, 97–103 (average, 100.5) mm.; tail, 130–142 (137); exposed culmen, 33.5–36 (34.7); tarsus, 31–38 (35.8); middle toe without claw, 22.5–25 (23.9).

Female:² wing, 95–99 (average, 97) mm.; tail, 127–135 (131); exposed culmen, 32.5; tarsus, 35–37 (36); middle toe without claw, 23.5–24 (23.7).

TYPE LOCALITY.—Rosario, 30° N. Lat., Lower California.

GEOGRAPHIC DISTRIBUTION.—Resident in the Lower and Upper Austral zones of northwestern Lower California, north to the San Pedro Martir Mountains, northern Lower California, and Ensenada; west to Ensenada, Santo Domingo (northeast of San Quintin), San Simon, and Rosario, Lower California; south to Rosario and San Fernando (30° N. Lat.); and east to San Fernando and the San Pedro Martir Mountains.

¹ Seven specimens, from Lower California and California.

² Two specimens, from Lower California.

Remarks.—Although this race, hitherto unrecognized, except by its original describers, is confined to a comparatively limited area, it is apparently well worthy of subspecific status. Even birds in juvenal plumage are, at least in series, distinguishable from those of *Toxostoma redivivum redivivum*, as they are more deeply ochraceous below and more rufescent above; in fact, the present race, on the whole, as much resembles *Toxostoma redivivum sonomæ* as it does the adjacent and intervening *Toxostoma redivivum redivivum*, but it is distinguishable from the former by its decidedly more brownish (less grayish) and paler jugular band, less rufescent (more grayish) upper surface, and lighter posterior lower parts. This close similarity to *Toxostoma redivivum redivivum*, together with the fact that its characters were not quite correctly stated in the original description, doubtless account in large measure for the failure of subsequent authors to recognize it as distinct. We take pleasure therefore in being able to restore it to good standing among its relatives. The very extensive series that we have examined shows the paleness and brownish cast of the jugular band to be very constant, and, indeed, the best character for separation from *Toxostoma redivivum redivivum* or *Toxostoma redivivum sonomæ*.

One hundred and thirty-seven specimens of this subspecies have been examined, from the following localities:

Lower California.—Ensenada (Feb. 27, 1906; May 18, 1905); Laguna Ensenada (April 5, 1910); San Fernando (Sept. 4, 1905); Santo Domingo, 25 miles northeast of San Quintin (August 19, 1905); 45 miles east of San Quintin (Jan. 20, 1894); San Simon (Oct. 22, 1903); Rosario (Oct. 25, 27, 28, 29, and 30, 1906; Nov. 1, 2, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 25, 28, and 29, 1906).

NOTES ON NORTH AMERICAN BIRDS.

IV.

BY HARRY C. OBERHOLSER.

THE notes contained in this article¹ relate chiefly to the status and relationship of several North American birds. The remarks on one species are, however, nomenclatural. The four species and subspecies here treated belong to the following families: Pelecanidæ, Rallidæ, Scolopacidæ, and Icteridæ.

***Pelecanus californicus* Ridgway.**

Mr. Robert Ridgway some time ago,² and Dr. E. Hartert somewhat more recently³ treated the California Brown Pelican as a subspecies of the eastern bird (*Pelecanus occidentalis* Linnæus); but this disposition recent writers have ignored. A careful examination of the considerable material now available leads to the conclusion that these two authors were correct in their view of its subspecific relationship. The Pacific bird, *Pelecanus californicus* Ridgway, differs from *Pelecanus occidentalis* of the Atlantic side of America in its decidedly larger size, darker brown hind neck, and, in the breeding season, by its reddish gular pouch. Neither the larger size nor the dark brown neck proves to be an entirely trenchant character, so that the only possible reason for treating *Pelecanus californicus* as a distinct species lies in the fact that during the breeding season its gular pouch becomes reddish. In view, however, of the ephemeral nature of this difference, it seems proper to consider the California Brown Pelican a subspecies of *Pelecanus occidentalis*, as Mr. Ridgway and Dr. Hartert have done. Its name becomes, therefore, *Pelecanus occidentalis californicus* Ridgway.

¹ For previous papers in this series, cf. 'The Auk,' XXXIV, April, 1917, pp. 191-196; XXXIV, July, 1917, pp. 321-329; and XXXIV, October, 1917, pp. 465-470.

² Proc. U. S. Nat. Mus., XIX, 1897, p. 593.

³ Novit. Zool., VI, 1899, p. 176.

***Creciscus coturniculus* (Ridgway).**

Mr. William Brewster has, from a systematic point of view, so fully and satisfactorily treated the Farallon Rail¹ that further remarks on the subject would now be unnecessary, were it not for the fact that most current authors consider it a species distinct from *Creciscus jamaicensis*, although both Mr. Ridgway and Mr. Brewster call it a subspecies. It differs, as explained by Mr. Brewster, from *Creciscus jamaicensis jamaicensis* in shorter, slenderer bill, darker lower parts, and more extended cervical chestnut area. None of these characters, however, holds constant in an extended series of specimens; for which reason it is perfectly evident that, although the Pacific Coast form is geographically far separated from the breeding area of the race of *Creciscus jamaicensis* inhabiting the eastern United States, we have here a case of subspecific relationship indicated by individual variation. The type of *Creciscus coturniculus*² is, as Mr. Brewster says, a specimen of the breeding Black Rail of California, not of either of the two Galapagos Islands species, *Creciscus spilonotus* (Gould) or *Creciscus sharpei* Rothschild and Hartert. Our California bird, therefore, must be called *Creciscus jamaicensis coturniculus* (Ridgway).

***Pisobia maculata* (Vieillot).**

The *Tringa maculata* of Vieillot³ was some time ago stated by Mr. G. M. Mathews⁴ to be preoccupied by "*Tringa maculata* Linnæus"⁵; and for the species now called *Pisobia maculata* the name *Tringa pectoralis* Say was resurrected. Since further attention has been recently drawn to this matter by Mr. T. Iredale,⁶ it seems worth while to point out that there is no *Tringa maculata* Linnæus⁷, but that in the place cited there occurs only *Tringa*

¹ 'The Auk,' XXIV, April, 1907, pp. 205-210.

² *Porzana jamaicensis* var. *coturniculus* Ridgway, Amer. Nat., VIII, February, 1874, p. 111 (Farallon Islands, California).

³ Nouv. Dict. d'Hist. Nat., XXXIV, 1819, p. 465.

⁴ Birds Australia, III, part 3, August 18, 1913, p. 261.

⁵ Syst. Nat., ed. 12, I, 1766, p. 249.

⁶ Ibis, ser. 10, III, No. 2, April, 1915, p. 390.

⁷ Syst. Nat., ed. 12, I, 1766, p. 249.

macularia, which is the original of the species now known as *Actitis macularia*. Our Pectoral Sandpiper must, therefore, retain its present designation of *Pisobia maculata* (Vieillot).

***Agelaius phœniceus arctolegus* Oberholser.**

The Northern Red-winged Blackbird was originally described¹ from specimens taken in Mackenzie, Alberta, and Manitoba. A large amount of material, much of it from the United States, examined during the last ten years, serves now to substantiate the validity of this form on the characters adduced in the original diagnosis. Although *Agelaius phœniceus arctolegus* has been sometimes synonymized with *Agelaius phœniceus fortis*, it is clearly different from that form by reason of the darker coloration of the female, both above and below; by the shorter wing and tail, larger bill, and somewhat paler buff of wing-coverts in the male; and is really much more closely allied to *Agelaius phœniceus phœniceus*, from which it is separable chiefly by its decidedly greater size, particularly the bill, as may readily be seen by reference to the original description.² Recent information permits also a much better delineation of its geographic range, which, together with that of *Agelaius phœniceus fortis*, as now restricted, are given below.

Agelaius phœniceus arctolegus.—Middle Canada with eastern and middle United States: breeds north to northern Manitoba and southern Mackenzie; west to southwestern Mackenzie, central Alberta, and central Montana; south to southeastern Montana, southeastern South Dakota, northwestern Iowa, southern Minnesota, and northern Michigan; east to northern Michigan and eastern Manitoba. Winters north at least to Arkansas and Kansas; south to southern Texas, Louisiana, and casually Alabama. Migrates west to Colorado and east to Ohio, casually to Connecticut.

Agelaius phœniceus fortis.—Middle United States, west of the Mississippi River: breeds north to Nebraska, Wyoming, western Montana, and Idaho; west to Idaho and Colorado; south to Colo-

¹ *Agelaius phœniceus arctolegus* Oberholser, Auk, XXIV, No. 3, July, 1907, p. 332 (Fort Simpson, Mackenzie, Canada).

² 'The Auk,' XXIV, No. 3, July, 1907, pp. 334-336.

rado and northwestern Texas, and east to central Nebraska. Winters south to Louisiana, southern Texas, and New Mexico (Aztec, Dec. 5, 1893; J. A. Loring). Occurs in migration east to eastern Nebraska and Arkansas.

THIRTY-FIFTH STATED MEETING OF THE AMERICAN ORNITHOLOGISTS' UNION.

BY T. S. PALMER.

THE Thirty-fifth Stated Meeting of the American Ornithologists' Union convened in Cambridge, Mass., on Monday, November 12, 1917. The business sessions were held at the Colonial Club and the public sessions, beginning November 13 and lasting three days, in the Nash lecture room of the University Museum. The attendance included 21 Fellows, 20 Members, more than 100 Associates, and a number of visitors. Among those present were three of the 23 Founders of the Union, seven other members who were elected at the first meeting in 1883, and five members from Canada. Twenty-six papers were presented at the public sessions and three others were read by title.

BUSINESS SESSION. At the meeting of the Fellows called to order at 3.40 P. M. by the President, Dr. Albert K. Fisher, 16 Fellows were present. Percy A. Taverner, of Ottawa, Canada, was elected to fill the single vacancy in the list of Fellows and the amendment to the By-Laws proposed at the last Stated Meeting, providing that in joint meetings of Fellows and Members, 15 shall constitute a quorum, was formally adopted.

At the evening meeting of the Fellows and Members, called to order by the President at 8.30 P. M., 18 Fellows and 16 Members were present. The present status of membership in the Union as reported by the retiring Secretary is as follows:—"Fellows, 49; Retired Fellows, 3; Honorary Fellows, 14; Corresponding Fellows, 59; Members, 77; Associates, 689; Total, 891.

During the year, Nov. 13, 1916 to Nov. 12, 1917, the Union lost thirty-seven members, fifteen by death, and twenty-two by resignation.

The deceased members were: Dr. Edward Pierson Ramsay, a Corresponding Fellow, who died in Truro, near Sydney, Australia, Dec. 16, 1916, at the age of 74; Alfred John North, a Corresponding Fellow, who died at Sydney, Australia, May 6, 1917, aged 62 years; Dr. Emil August Goeldi, a Corresponding Fellow, who died in Bern, Switzerland, July 5, 1917, in the 58th year of his age, and the following Associates: William Purdy Shannon, of New York City, who died Oct. 29, 1916; Dr. R. L. Walker, of Carnegie, Pa., who died Nov. 19, 1916; Francis Windle, who died in West Chester, Pa., Feb. 24, 1917, in his 72d year; Newell A. Eddy, who died in Bay City, Mich., Feb. 28, 1917, in his 61st year; Mrs. Eleanor Beckwith Hitchcock, who died in Waterbury, Conn., March 3, 1917; Dr. Henry McHatton, of Macon, Ga., who died April 22, 1917; Norman DeWitt Betts, who was killed by lightning in northeastern Utah, May 21, 1917, in his 37th year; Chas. E. Ingalls, of East Templeton, Mass., who died May 31, 1917; Dr. Bert Heald Bailey, who died at Cedar Rapids, June 22, 1917, aged 42 years; Timothy Otis Fuller, who died in Needham, Mass., Aug. 17, 1916, aged 71 years; Samuel Wright, who died at Yonkers, N. Y., Jan. 18, 1917, in his 42nd year, and Mrs. Katharine Rebecca Styer, who died in Concordville, Pa., Jan. 20, 1917, in her 59th year."

The report of the treasurer showed the finances of the Union to be in a satisfactory condition with a balance of \$373.05 in receipts over current expenses and a total surplus, including receipts from life memberships and other invested funds, of \$3712.05.

The result of the election of officers for the ensuing year was as follows: President, John H. Sage, who had served as Secretary for 28 years; Vice-Presidents, Henry W. Henshaw and Witmer Stone; Secretary, T. S. Palmer; Treasurer, Jonathan Dwight; Members of the Council, Ruthven Deane, William Dutcher, Joseph Grinnell, Frederic A. Lucas, Wilfred H. Osgood, Charles W. Richmond, and Thomas S. Roberts.

Arthur Humble Evans of Cambridge, England, and William Lutley Sclater of London were elected Honorary Fellows, and

Frank Evers Beddard of London was elected a Corresponding Fellow. Rollo H. Beck, San Jose, Calif.; Winthrop Sprague Brooks, Boston, Mass.; James P. Chapin, New York City; Francis Harper, Washington, D. C.; and Winsor M. Tyler, Lexington, Mass., were elected to the class of Members; and the following one hundred and thirteen persons were elected Associates:

- Miss Florence I. Abbott, Upland Road, Andover, Mass.
 William Dunford Appel, University of Chicago, Chicago, Ill.
 Dr. H. Arey, Hospital Cottages for Children, Baldwinville, Mass.
 Edward Herbert Atherton, 82 Ruthven St., Roxbury, Mass.
 Francis L. Bacon, 236 Winona Ave., Germantown, Philadelphia, Pa.
 Arthur C. Badger, Dudley Road, Newton Centre, Mass.
 S. Prentiss Baldwin, 2930 Prospect Ave., Cleveland, O.
 Henry Bartlett, P. O. Box 68, Acushnet, Mass.
 Mrs. Harriet T. Boyd, 17 Marsh St., Dedham, Mass.
 Barron Brainerd, 57 Monmouth St., Brookline, Mass.
 G. Franklin Brown, Stonebridge, Needham, Mass.
 Claude A. Butterwick, 116 Broad St., Telford, Pa.
 A. H. Cahn, Biology Bldg., University of Wisconsin, Madison, Wis.
 Mrs. J. B. Campbell, 263 W. 7th St., Erie, Pa.
 Mrs. Thomas Carne, 41 Melrose St., Adams, Mass.
 Robert F. Cheney, Southborough, Mass.
 George K. Cherrie, Am. Mus. Nat. Hist., New York, N. Y.
 Charles A. Clark, 60 Lynnfield St., East Lynn, Mass.
 Llewelyn W. Cleveland, Vineyard Haven, Mass.
 Philip Hacker Cobb, 35 Matthews Hall, Cambridge, Mass.
 Robert L. Coffin, Mass. Agr. Expt. Station, Amherst, Mass.
 Mrs. Henry Franklin Cone, 4 Trinity St., Hartford, Conn.
 Miss Ada B. Copeland, 1103 White Ave., Grand Junction, Colo.
 Walter S. Cowing, 458 Locust Ave., Germantown, Philadelphia, Pa.
 Charles W. Dimick, 1007 Tremont Bldg., Boston, Mass.
 Joseph Scattergood Dixon, Mus. Vert. Zool., Univ. California, Berkeley, Calif.
 William H. Dunbar, 14 Sessions St., Bristol, Conn.
 Walter G. Fanning, 2 Hunt St., Danvers, Mass.
 Edward Rogers Farrar, South Lincoln, Mass.
 William Harmanus Fisher, Stock Exchange Bldg., 201 East Germain St., Baltimore, Md.
 Ralph E. Forbes, 328 Adams St., Milton, Mass.
 Mrs. John A. Gallagher, 5240 Belleview Ave., Kansas City, Mo.
 A. E. Ganier, 1221 17th Ave. S., Nashville, Tenn.
 Donald Andrew Gilchrist, Biological Survey, U. S. Dept. Agr., Washington, D. C.

- Mrs. C. H. Gleason, 700 Madison Ave., S. E. Grand Rapids, Mich.
 Raymond J. Gregory, Princeton, Mass.
 Horace Oakes Green, 114 North Ave., Wakefield, Mass.
 Frederick Greenwood, 1724 8th Ave., Spokane, Wash.
 Bertram S. Griffin, 22 Currier Ave., Haverhill, Mass.
 George W. Hager, R. F. D. No. 3, Peterboro, N. H.
 F. Gregory Hall, Milton, Wis.
 William Webster Hall Jr., 15 East 75th St., New York, N. Y.
 Walter C. Henderson, Asst. Chief Biological Survey, U. S. Dept. Agr.,
 Washington, D. C.
 Newbold Lawrence Herriek Jr., Cedarhurst, Long Island, N. Y.
 Hiram A. Hotchkiss, Harding, Mass.
 Dr. Lombard Carter Jones, Falmouth, Mass.
 Francis T. A. Junkin, 2541 Michigan Ave., Chicago, Ill.
 Allan Keniston, Edgartown, Mass.
 Harry Stephen Ladd, 4354 McPherson Ave., St. Louis, Mo.
 Hamilton M. Laing, 1277 E. 32d St., N., Portland, Ore.
 Ralph Lawson, 88 Washington Square East, Salem, Mass.
 John C. Lee, Grove St., Wellesley, Mass.
 Mrs. Edward Lees, 252 Franklin St., Winona, Minn.
 Edward C. Lewis, 607 Somerville Ave., Somerville, Mass.
 John Alden Loring, Owego, N. Y.
 George MacReynolds, Doyleston, Pa.
 Ferdinand Schuyler Mathews, 17 Frost St., Cambridge, Mass.
 Dr. George R. Mayfield, Kissam Hall, Vanderbilt West Campus,
 Nashville, Tenn.
 Albert D. McGraw, 5611 Stanton Ave., Pittsburgh, Pa.
 Harry Arthur McGraw, 1805 15th Ave., Altoona, Pa.
 T. H. McHatton, 163 Mill St., Athens, Ga.
 Clyde McNickle, 417 Spruce St., New Castle, Pa.
 B. G. Merrill, Hinsdale, Ill.
 F. P. Metcalf, Biological Survey, U. S. Dept. Agr., Washington, D. C.
 Mrs. Henry A. Miles, Hingham, Mass.
 J. Sidney Moulton, Stow, Middlesex Co., Mass.
 Leon Nelson Nichols, 1086 Amsterdam Ave., New York, N. Y.
 Winthrop Packard, 1442 Washington St., Canton, Mass.
 Charles Jackson Paine, 705 Sears Bldg., Boston, Mass.
 Charles M. Parker, Box 141, Fiskdale, Mass.
 Mrs. Charles M. Parker, Box 141, Fiskdale, Mass.
 Mrs. Regina A. Paxton, 4728 13th St. N. W., Washington, D. C.
 Keble Perine, 26 Trull St., Dorchester, Mass.
 Dr. Anne Elizabeth Perkins, So. Calif. State Hospital, Patton, San
 Bernardino Co., Calif.
 Frank O. Pilsbury, P. O. Box 84, 1088 Main St., Walpole, Mass.
 Hon. Edmund Platt, Poughkeepsie, N. Y.
 Miss E. Porter, 75 Saint James St. E., San Jose, Calif.

- Mrs. S. W. Powell, West Becket, Mass.
 George D. Pratt, Conservation Commission, Albany, N. Y.
 Charles I. Rawson, Oxford, Worcester Co., Mass.
 Milton Smith Ray, 220 Market St., San Francisco, Calif.
 Egmont Z. Rett, 3902 Pecos St., Denver, Colo.
 W. D. Richardson, 4215 Prairie Ave., Chicago, Ill.
 Miss Nancy P. H. Robben, 412 E. Merrimack St., Lowell, Mass.
 Frank Robbins, Onset, Mass.
 Royal Elisha Robbins, 61 Monmouth St., Brookline, Mass.
 Conrad K. Roland, 1208 De Kalb St., Norristown, Pa.
 L. F. Savage, 1210 Jenny Lind St., McKeesport, Pa.
 Bradford A. Scudder, Greenwich, Conn.
 Daniel William Shea, Catholic University, Washington, D. C.
 Lester L. Shirley, 604 S 10th St., Vincennes, Ind.
 Miss Rose Smith, College of St. Teresa, Winona, Minn.
 Miss Caroline Gray Soule, 187 Walnut St., Brookline, Mass.
 Miss Clementina S. Spencer, Dept. Zoölogy, Coe College, Cedar
 Rapids, Ia.
 Henry B. Steele, 4530 Drexel Blvd., Chicago, Ill.
 Mrs. Cecil Stewart, 451 Beacon St., Boston, Mass.
 Dr. Arthur M. Stimson, Raymond St., Chevy Chase, Md.
 Gardener D. Stout, 129 East 55th St., New York, N. Y.
 Horace Taylor, 93 Binney St., Roxbury, Mass.
 Gerald Thorne, Logan, Utah.
 Miss Flora Trites, State Normal School, Winona, Minn.
 Harry S. Trull, 317 East 196th St., New York, N. Y.
 Stanton Warburton Jr., 1221 North Fife St., Tacoma, Wash.
 James Dewey Watson, 6042 Harper Ave., Chicago, Ill.
 Mrs. Jennie E. B. Webster, The University Society, 44 East 23d St.,
 New York.
 John B. Wheeler, East Templeton, Worcester Co., Mass.
 Leo Wiley, Palo Verde, Imperial Co., Calif.
 Mrs. Etta S. Wilson, 2 Clarendon Ave., Detroit, Mich.
 Patrick Richard Wolf, 1129 Tinton Ave., New York, N. Y.
 Dr. Casey A. Wood, 7 W. Madison St., Chicago, Ill.
 Mrs. N. P. Wood, Northfield, Mass.
 Dr. Lemuel F. Woodward, 52 Pearl St., Worcester, Mass.
 Frank S. Wright, 14 Cayuga St., Auburn, N. Y.

The Committee on Biography and Bibliography through its chairman Dr. Palmer submitted a brief verbal report showing progress in most of the projects outlined in the last report (Auk, XXXIV, pp. 445-452, 1917). During the year efforts have been concentrated mainly on an 'Index of Portraits of Ornithologists', and a 'Bibliography of Bibliographies'. The Index now contains

references to published portraits of more than 700 ornithologists including about 300 members of the Union. This work is sufficiently advanced to warrant publication during the coming year. The Bibliography of Bibliographies comprises references to about 200 special bibliographies which contain about 26,000 titles. These include 70 authors' bibliographies with 9,500 titles, 80 faunal bibliographies with 12,500 titles and 50 miscellaneous bibliographies with 4,000 titles.

It was voted to exempt members of the Union actually engaged in military service, from payment of dues during the continuance of the war, and the Secretary was instructed to prepare a list of such members, (see p. 111).

PUBLIC SESSIONS. *First Day.* The meeting on Tuesday was called to order by the President, John H. Sage, at 10.20 A. M. After a brief announcement by the Secretary of the result of the election of officers and members the papers on the program were taken up in the following order:

'Cape May, New Jersey, and its Bird Life', by Dr. Witmer Stone.

'A Purple Martin Roost in the City of Washington, by Dr. H. C. Oberholser.

'Demonstration of a Feeding Slab', by William E. Saunders. This slab is devised to prevent sparrows from taking food put out for chickadees, nuthatches and similar birds. The food comprising nuts, sunflower seeds and suet is fastened to the under side of a board by simply heating the fat which sticks to the slab and being on the under side is out of reach of sparrows.

'Notes on British Guiana Birds, by C. William Beebe. Illustrated by lantern slides.

'Notes on the Breeding Warblers of Central New York, by Arthur A. Allen. Illustrated by lantern slides.

At the afternoon session, called to order by Vice President Stone, four papers were presented:

'Birds on Turrialba', Costa Rica, by Charles H. Rogers. Illustrated by lantern slides.

'The Present Status of our Black-capped Petrel,' with exhibition of skins and lantern slides, by G. Kingsley Noble.

'A four-months' Collecting Trip in Nicaragua,' by W. DeWitt Miller.

'In Audubon's Labrador,' by Dr. Charles W. Townsend. Illustrated by lantern slides.

Second Day. The meeting on Wednesday was called to order by Vice President Stone.

The first paper was: 'The Discovery of the Breeding Ground of the Large-billed Sparrow, and its consequences,' by Dr. H. C. Oberholser.

An hour was then devoted to a discussion of 'Ornithological Work in 1917.' The subject was introduced by the Secretary and the discussion was participated in by Dr. Oberholser, Dr. Chapman, and Messrs. A. A. Allen and T. Gilbert Pearson who mentioned various features of the activities of the year. The three other papers presented at the morning session were:

'Ferruginous Stains on Water-fowl,' read by A. C. Bent for the author, Frederic H. Kennard.

'The Span of Life and Period of Activity of Ornithologists,' by Dr. T. S. Palmer.

'A Review of the Work of the Asiatic Zoölogical Expedition of the American Museum of Natural History,' by Roy C. Andrews. Illustrated by lantern slides.

The afternoon program was opened by a paper on 'Sight Records — a Problem of Present-day Ornithology,' by Dr. Witmer Stone.

The remainder of the session was occupied by two interesting accounts of Ornithological field work in South America, illustrated by many lantern slides:

'An Ornithological Journey from the Tableland to the Tropics in Peru,' by Dr. Frank M. Chapman, and

'The Explorations of Rollo H. Beck in South America and the West Indies for the Brewster-Sanford Collection,' by Robert Cushman Murphy.

Third Day. The meeting on Thursday was called to order by Vice President Stone and five papers were presented at the morning session.

'Notes on *Oceanites oceanicus*,' by Robert Cushman Murphy.

'Vincent Barnard, an early Pennsylvania Ornithologist,' by Dr. Witmer Stone.

'In Memoriam — Edgar Alexander Mearns,' by Dr. Charles W. Richmond, read by Dr. Oberholser in the absence of the author.

'Some Phases of Summer Bird Life on the Arctic Coast,' by Dr. Rudolph M. Anderson. Illustrated by lantern slides.

'Tail Feathers and their Upper Coverts,' by Dr. Hubert Lyman Clark.

At the afternoon session several short papers were presented:

'Two Wounded Birds,' by Mrs. E. O. Marshall.

'Responsive Notes of some African Bush Shrikes' with imitations of the birds' calls, by Dr. Glover M. Allen.

'The Future of the Federal Bird Reservations', by Dr. George W. Field. Illustrated by lantern slides.

'Exhibition of a Reel of Motion Pictures of a Loon taken by George D. Pratt,' by Robert Cushman Murphy.

J. Hooper Bowles' paper on 'The Limicolæ of the State of Washington' was read by title in the absence of the author, as was also John T. Nichols' 'Notes on Shore-bird Migration'. Howard H. Cleaves' 'Additional Studies of some Eastern Birds in Motion Pictures,' was unavoidably omitted because of delay in delivering the film before the session closed.

Resolutions were adopted thanking the Museum authorities of Harvard University for the use of the lecture hall for the meetings of the Union and for other courtesies extended, the Nuttall Ornithological Club for the cordial welcome and generous hospitality shown visiting members and friends, and the Boston Society of Natural History for the hospitality extended to the Union and its friends.

Other Events. The members and visitors were guests of the Nuttall Ornithological Club at luncheon each day at the Colonial Club. On Tuesday evening an illustrated lecture was given by Wm. L. Underwood, at the Boston Society of Natural History and was followed by an informal reception. On Wednesday evening the members met at dinner at Mifflin Hall in Brattle Square, Cambridge, and were afterward entertained by Dr. Charles W. Townsend who presented original descriptions, illustrated by lantern slides, of a number of the members. On Friday, November 17, after adjournment of the Union, about forty of the members conducted by Dr. Townsend and Mr. Francis H. Allen visited the sand dunes at Ipswich, Mass., where Ipswich Sparrows, Snow Buntings, and other characteristic birds were observed.

Opportunities were afforded for inspecting the collections of the Boston Society of Natural History and the Museum of Comparative Zoölogy, where the celebrated Lafresnaye collection of foreign birds is now preserved. Some of the members also examined the interesting collections of Anduboniana and Wilsoniana in the library of the Museum and visited several places of historic interest in Cambridge including the house (still in an excellent state of preservation) where Thomas Nuttall lived, and Mt. Auburn cemetery where Dr. Thomas M. Brewer, Dr. Henry Bryant and Dr. Samuel Cabot are buried.

The registered attendance of fellows and members was larger than at any previous meeting in Cambridge, the subjects aroused more discussion than usual, and an interesting feature was the number of papers on the birds of foreign countries, including those of northern Canada, Costa Rica, Nicaragua, British Guiana, Peru, Chile, Falkland Islands, China and Africa.

The next meeting of the Union will be held in New York City, in 1918, at a date to be determined by the local committee.

GENERAL NOTES.

Common Tern Nesting at Thousand Islands.— During two successive seasons I have found the nests and eggs of the Common Tern (*Sterna hirundo*) at the Thousand Islands.

On June 26, 1916, at Black Ant, a small isolated island just over the Canadian boundary, the flat rocky shores were covered with groups of brown splotched eggs. On July 27, 1917, at Eagle Wing, a very small island, hardly more than a large boulder, within a half-mile of Clayton, N. Y., eggs were tucked away in every convenient spot. On this island I captured and banded a young tern. He looked like a tiny yellowish chicken all covered with down, with black spots above, pinkish feet and bill, the latter black-tipped with a white dot, and angled below, of course.

Authorities at the New York State Museum inform me that this is a new record. Eaton in his 'Birds of New York' (1901) notes that "This bird is not known to breed within our limits, except on the seacoast." — MABEL METCALF MERWIN, *Clinton, New York*.

European Widgeon at Madison, Wis.— On April 22, 1917, a flock of ducks was observed in a small pond at the eastern end of Hammersly's Marsh. It contained about thirty Baldpates, a few Shovellers and Mallards, and a duck which at the first hasty glance I thought was a Redhead. In going over the flock carefully I saw to my great surprise that the latter bird was a fine European Widgeon, the white band on the crown making identification unmistakable. The birds were very tame and allowed my Airedale to pursue them repeatedly without flying more than a few feet. Having no means of collecting the bird at the time I returned early the following morning in company with Mr. Warner Taylor. The birds were still in the same pond and after observing the Widgeon to our satisfaction I carefully approached the place behind a weedy fence. On raising my head there was the European Widgeon swimming directly towards me not more than sixty feet away. He walked out on the shore and began feeding.

It is truly painful for me to state that I fired point blank at that bird with a twelve gauge Winchester and the net result was a few feathers. There never was a bird that I wanted more but the fact remains that he flew into the marsh and soon began feeding. I tried in vain for an hour to get another shot.

The evening of the 24th the bird was still there and I lay on the ground in a cold driving rain until dark but was unable to get a shot. On the afternoon of the 26th I tried again with Mr. Taylor, he approached the pond from a direction opposite to my position in the weeds with the hope that the birds would come in, but they were now very wary, the European Widgeon being the second bird to leave the water. On the 29th Mr. Taylor found that the ducks had left the marsh.

Curiously enough on the 28th, Mr. G. H. Jenkins observed apparently the same European Widgeon in a flock of Baldpates about ten miles farther north in the Yahara Marshes and also missed a shot.—A. W. SCHORGER, *Madison, Wis.*

The European Widgeon in Massachusetts.—Messrs. Angell and Cash, the well-known taxidermists of Providence, Rhode Island, have kindly given me permission to report that an adult male European Widgeon (*Mareca penelope*), recently skinned and mounted by them, was shot at Chappaquiddick, Vineyard Sound, Massachusetts, October 6, 1917, by Mr. Arthur R. Sharpe. The specimen has been identified by Mr. Arthur C. Bent and Mr. John C. Sharpe, Jr. It would be interesting to know whether, as would seem to be the case, this old world species visits our Atlantic sea-board oftener now than formerly or is found there oftener merely because competent field observers of bird life are so much more numerous and omnipresent than they were thirty or forty years ago.—WILLIAM BREWSTER, *Cambridge, Mass.*

Little Blue Heron in Pennsylvania.—I wish to record two Little Blue Herons, *Florida cærulea*, male and female, in the white plumage, August 11, 1908, taken on the Conodoguinet Creek opposite the city of Harrisburg, Pa., for the Pennsylvania State Museum by Assistant Taxidermist W. J. Durborrow. These two birds were found in company with a flock of egrets. They were mounted and now form part of a group of Herons in the Pennsylvania State Museum.—BOYD P. ROTHROCK, *State Museum, Harrisburg, Pa.*

Northern Phalarope (*Lobipes lobatus*) in Michigan.—Professor W. B. Barrows has evidently overlooked an earlier record of the Northern Phalarope (*Lobipes lobatus*) in Michigan, when he states that two specimens procured in Sanilac Co., on Oct. 4 and 28, 1911, "seem to establish the bird properly in the Michigan List." (*Auk*, 1916, 336.) In 'The Auk,' 1913, p. 111, I recorded a ♀ taken in Lenawee Co., Sept. 14, 1899, by Dr. C. M. Butler, No. 170517 U. S. National Museum, which seems to constitute the first authentic record in the state.—B. H. SWALES, *Museum of Zoology, Ann Arbor, Michigan.*

Sharp-tailed Grouse at Tremont, Indiana.—Although familiar for many years with the Indiana dune region I never saw the Sharp-tailed Grouse (*Pediaceetes p. campestris*) there until April, 1915.

A party of us were ascending Mt. Holden, a high dune about 200 feet high, just west of the Beach House of our Prairie Club, at Tremont, when I noticed some large tracks, like chicken tracks. We went quietly up the dune, and at the top saw a large grouse-like bird. It was not the least afraid of us, and allowed us to come about fifteen feet from it, giving us

an excellent opportunity of examining it, while at the same time it had the opportunity of examining us, which it did thoroughly.

It walked to and fro in a semicircle, with its head over its shoulder on the side toward the party, betraying not the slightest sign of fear, but on the contrary, the liveliest curiosity. We had never before seen a bird just like it, though some of us had shot a number of Ruffed Grouse, which are found in the dunes, and also Prairie Chickens.

It looked like a cross between these two species, plus a dash of Plymouth Rock stock. It was larger than either of the above-mentioned Grouse, resembling perfectly in shape and color, the picture of the Sharp-tailed Grouse in the 'National Geographic Magazine' for August, 1915.

We could see the preponderance of the ochraceous rusty-brown color with pale and dark bars and patches, giving somewhat the appearance of a young Plymouth Rock cockerel. We could see the feathers on the legs, coming down to the base of the toes, and also the projecting feathers in the middle of the tail.

After the bird had watched us sufficiently, it suddenly sprang up without the slightest noise, and soared away, first circling over Lake Michigan for some distance and then returning past us to the big woods to the south-east.

Since then this bird or a similar one has been seen by members of the Prairie Club in the big woods near the same spot, especially by Capt. Charles Robinson; A. Leonard and John Leegwater. Mr. Leegwater has had a better opportunity to study it than any one else, as he almost stepped on it in the swamp near the big woods, a few months later.

It did not fly off right away, but acted as if it had little ones, trying to draw him away, by pretending to be hurt. This was in September which seemed too late for young ones.

As I found no Indiana records, I was a little doubtful until I made inquiries. Butler in his 'Indiana Birds,' said that it might be found there. Mr. M. F. Green of Tremont, Indiana, an old resident, said he had occasionally seen and shot them since boyhood. Mr. Brown of Tamarack, the care-taker of the great Wells estate of 2200 acres of dunes, says he has also occasionally shot them, and that they breed in the dunes. Both of these settlers considered them a curious kind of Partridge, or Ruffed Grouse, of which there are a number in the dunes. Dr. J. Barrett, the State Geologist of Indiana, states that it has never before been recorded as a resident of Indiana.—GEORGE A. BRENNAN, *Chicago, Ill.*

The White-winged Dove (*Mclopelia asiatica asiatica*) in Georgia.—On January 6, 1917, Mr. Harrison Lee, while out shooting Mourning Doves near his home three miles south of Hoboken, Pierce County, Georgia, observed a White-winged Dove perching in a little bush in an open field. Thence it flew to a fence-post, where it was shot. Mr. Lee left the specimen on a shelf in his house overnight, with the intention of having it preserved, but on the following morning it was found badly damaged by mice.

Accordingly, he saved only the head and right wing, and on January 8 brought them to the writer at Floyd's Island in Okefinokee Swamp. These parts, which were preserved for the U. S. Biological Survey collection, readily establish the identity of the bird as *Melopelia asiatica asiatica*.

This constitutes apparently the first record of the species in Georgia.—FRANCIS HARPER, *Washington, D. C.*

The Harpy Eagle in Colorado.— In *November*, 1902, the following skit appeared in one of the Denver daily papers (probably the Republican).

"First Harpy eagle found in Colorado — Owner will make his the Only Mounted Specimen Known in United States. Pueblo, Colo., Nov. 29.— (Special). What is thought is the first specimen of the Harpy Eagle ever met with in Colorado has been sent to Capt. W. F. Dortenbach of this city by George H. Cress of Lees, Colo. It measures 7 feet, 11 inches, from tip to tip, and 42 inches, from beak to tail. It weighs 30 pounds. The bird is of a species exceedingly rare. So far as is known there are no mounted specimens in the country. The Smithsonian institute at Washington has several skins. The captain will at once mount the specimen, and will communicate with the leading ornithologists of the country."

The undersigned sent a letter to Capt. Dortenbach, asking for further data concerning this newspaper note and received the following reply:—

"Pueblo, Colo., Feb. 9. 1903.

Dr. W. H. Bergtold,
624 14th St., Denver.

Dear Sir:

Your favor of Feb. 2nd to hand. The Eagle of which you saw a note in the papers some time ago is still in my possession. Its identification was by myself but I only have Coues Key to North American Birds and as it is quite old it may be somewhat faulty. We are still working at the identification of the specimen and if it should prove to be a harpy eagle I will give you all the necessary data when I make my report to the Society. Thanking you for the inquiry and trusting that I may be able to meet you when I visit Denver again.

Very respectfully yours,

(signed) W. F. Dortenbach."

During the succeeding fourteen years this matter returned to the writer's mind several times, but, never having received further word from Capt. Dortenbach (which his letter promised in case the specimen should prove to be a harpy eagle), it was concluded that, on careful further study at Pueblo, it had been found that the bird was not a harpy eagle.

It was a matter of much surprise to the writer to find this old news-

paper record resurrected recently, and used to erect a record for this species in Colorado.¹

This list by Lowe places in scientific ornithological literature a record of a bird which has hitherto not been observed in the United States, and one of (probable) great rarity even in Mexico, and is a record based on data which seem rather dubious, and clouded by uncertainty. The writer's interest in Colorado ornithology impelled him to send two other letters of inquiry to Capt. Dortenbach but they remain unanswered up to the present moment (December 4, 1917). The above facts are published, not only to add to the completeness of this alleged record, but to exhibit the ground on which the writer personally feels warranted in rejecting this record, and in advising his ornithological confreres to do likewise.—W. H. BERGTOLD, *Denver, Colo.*

The Happy Eagle in Colorado.—An interesting example of the great care necessary in placing occurrences of rare species on permanent record, is contained in 'The Auk' for October, 1917. In a paper appearing in this issue by Mr. Willoughby P. Lowe, entitled 'Remarks on Colorado Birds,' is a record for the Harpy Eagle, *Thrasaëtus harpyia*, which, if valid, would not only be new for the Colorado list, but in all probability would constitute the only record for North America. The occurrence is based on a specimen "shot by Geo. Cress of Lees, Pueblo Co., some years ago and preserved by (W. F.) Doertenbach of Pueblo".

Immediately upon noting the above, I wrote to Mr. Doertenbach, who had previously afforded me considerable assistance in clearing up other records credited to Colorado, asking for a statement regarding the specimen and for the address of Mr. Cress. An interesting correspondence ensued which, through the courtesy of Mr. Doertenbach, I am permitted to use, together with a photograph of the mounted specimen, still in the possession of Mr. Cress, now of Carson City, Nevada. In replying to my original inquiry, Mr. Doertenbach wrote in part, as follows:—"...the specimen ... we think is a Harpy Eagle. ... [and I] ... will ... send you a photo of the mounted specimen. The bird was not mounted with the ruff about the head spread so it will not resemble the specimens in the National Museum collections. Also the specimen was larger than the one displayed in that collection and the feathers about the head were not so grey.... The bird in question may not have been a Harpy but it is distinctly different from any other eagle that I have ever handled".

From the photograph sent with the above it was at once apparent that the bird was not a Harpy but was an immature Bald Eagle, *Haliaeetus leucocephalus*, which is, however, rare in Colorado. The peculiar plumage of the young of the latter species evidently caused the confusion. I thereupon had the photograph of the Harpy Eagle in Mr. C. W. Beebe's book

¹ Remarks on Colorado Birds. Willoughby P. Lowe. Auk, October, 1917, p. 454.

'The Bird,' copied, sending one copy to Mr. Doertenbach and another to Mr. Cress, with the request that they advise me whether or not it resembled the specimen in question. Both agreed that it did not. Mr. Cress, in his reply, stated positively that the photograph sent him "does not compare at all" with his specimen, stating further that "it has no extra long feathers on the back of the head like your photo", but that "its head is smooth like the Grey Eagle or Bald Eagle".

It seems probable that at the time of the collection of the specimen, considerable discussion was engaged in by the interested parties, the conclusion that it was a Harpy being reached without the proper knowledge of the status or appearance of this species. — F. C. LINCOLN, *Denver, Colo.*

Sap Drinking by Sapsuckers and Hummingbirds.— Mr. H. Mousley's notes on 'Sap Drinking Habits of Warblers' bring to mind some of the experiences which Mrs. Wright and I had through considerable of the summer of 1912. The ensuing fall Mrs. Wright made the following notes which might have some interest in this connection.

Mr. Alvah A. Eaton has written of Anna's Hummingbird in California visiting the holes of a Sapsucker (*Sphyrapicus ruber*). Mr. Frank Bolles has told of his observations of the Ruby-throat (*Trochilus colubris*) in Maine as a regular attendant at the holes of the Yellow-bellied Sapsucker (*Sphyrapicus varius*). Last summer we had the pleasure of watching this interesting phenomenon.

We were camping near Dorset, Ontario. Nearby there were many trees girdled with the holes of the Yellow-bellied Sapsucker. Yellow birches were the favorite haunts. Two birches just behind the camp seemed the special rendezvous for both sapsuckers and Ruby-throated Hummingbirds. Indeed the Hummingbirds seemed very much at home, delicately sipping sap at the table of their yellow-bellied friend. As the holes were about fifteen feet from the ground, we fastened a platform between a ladder and the tree on a level with the holes. Even this unsightly object did not lessen the birds' visits, and one could stand at the top of the ladder with camera on the platform scarcely six feet from the birds. The birds were so active however, that it proved difficult to get many pictures.

There was at least one whole family of sapsuckers who came frequently. Their different modes of approach were interesting. Sometimes, one would fly to a large tree near by, and then directly to the holes after looking all around, or he might fly to the top of the tree and then work his way down the trunk. One bird almost invariably flew to a branch below the holes and one the far side of the trees, edged along this branch, then flew to the side of the tree away from the platform, and next cautiously worked his way around to the fresh holes.

Quite different was the hummer's approach. The first intimation of his visit was likely to be the whirl of wings past one's ears. Quite frequently, he visited the tree while the sapsucker was there, and at times when he

arrived first, even tried to keep the sapsucker away. At other times, the sapsucker retaliated and kept the hummer away. Seldom did the hummer's presence keep the sapsucker from coming. There were at least four hummingbirds that visited this one tree, and the combats between them were highly entertaining. One male would not allow the other male to approach while he was there. He would allow one female to visit, but never the other one. Nor would the two females tolerate one another's society.

Very often the hummers rested quietly on the branches nearby, sometimes for long periods even when no bird was at the tree, neither did we observe that they showed much agitation, swinging the head, as Bolles describes.

In drinking the sap, they most often hovered just below the hole, keeping their bills in the hole and taking long draughts. At other times, they clung to a small projecting piece of bark below the holes, and folded their wings.

The birds usually came from one of two directions and flew away in the same directions, leading us to suppose that there were but two pairs which came, and also that this might be one of a round of trees.

A few butterflies, many hornets, and a host of smaller insects were at the holes. These small insects were, I judged, the attractive feature to the female Black-throated Blue Warbler who visited the tree several times.

These observations extended from July 28—September 10 and were not solely fall records. We noted that the Black-throated Blue Warbler would sometimes hover like a hummingbird before the sap but usually the bird would alight on and proceed diagonally around the hole, more like a nuthatch or Black and White Warbler and not after the fashion of a woodpecker.—A. A. and A. H. WRIGHT, *Ithaca, N. Y.*

Starlings (*Sturnus vulgaris*) at Barnstable, Mass.—Mr. W. S. Holway of Watertown, Mass., who has a hunting shanty on the Great Marshes at Barnstable, communicated to the writer the following bird tragedy.

The shanty which has not been in use during the summer was visited on August 26 by Mr. Holway's brother, who was to look it over and put it in order for the fall gunning. As he entered he heard a flutter in the vertical part of the stove pipe, and some distance above the damper discovered a small hole in which he thought he could see something moving. Enlarging the opening to investigate, sixteen birds came flying out one by one. On taking down the pipe he found a solid mass of dead birds from the damper to the hole, and a dozen more in the horizontal run. At the bottom of the outside chimney, into which the horizontal pipe fitted, were at least fifty. In all, he said, there were over one hundred. Specimens brought to the writer for identification proved to be Starlings.

The birds made their entrance through the slots of the cap on the chimney; and were evidently unable to fly up and out of the small pipe or to

crawl up its smooth, glazed lining. Mr. Holway placed some fine chicken wire over the cap to prevent the birds from entering in the future. Incidentally, this suggests the lines along which a Starling trap may be made when it shall become necessary to deal more strenuously with these annoying pests.—T. E. PENARD, *Arlington, Mass.*

Yellow-headed Blackbird in New Jersey.—A specimen of the Yellow-headed Blackbird (*Xanthocephalus xanthocephalus*) was secured on Newton Creek, N. J., near Audubon, by Mr. Wm. J. Kelton on September 1, 1917. It is a male of the first year, and has been mounted. I am indebted to Mr. Joseph W. Tatum for calling my attention to the capture and for bringing the specimen to me for identification.—WITMER STONE, *Academy of Natural Sciences, Philadelphia.*

The Bohemian Waxwing in Grand Junction, Colo.—In order to make more complete the local records of the remarkable wave of Bohemian Waxwings which passed over the Rocky Mountain Region last winter, I wish to put into print the following notes, made at the time by myself, on the occasions of the species' visits to Grand Junction. In order to make clear the import of some of my remarks, it becomes necessary to say that Grand Junction is on the Grand River, and is, in effect, at the western edge of the Rocky Mountain range, and its outlying foothills, its altitude being 4583 feet.

The first pair of these birds was seen February 25, 1917, in some bushes on the Grand River in the western part of the city, and on February 28 a second (or the same) pair was seen at the same place. A few days later a large flock was observed by Mr. Harmon on his ranch east and north of the city. Between March 3 and 19, many flocks—and large ones—were noticed every day on the river; they would first be seen on the river where it passes through Grand Junction, about 10.30 in the morning, travelling down stream, very slowly, and resting and flying from tree to tree, and bush to bush. The procession of birds continued all day, and ceased about four o'clock P. M. All went downward on the river, and seemed never to leave it to go into the residential portions of the city. On the ranches the general direction of movement was northwest. All of the irrigating canals and laterals were dry at this time and this may account for the river movement, though I am not sure that such is a correct explanation. I could not determine with certainty what the birds were eating but Mr. Harmon was convinced that they worked on the buds and insects of the ranch orchard trees. At times the birds seemed stupid as if they had eaten too freely before reaching my post of observation. Large flocks appeared from time to time on the neighboring ranches, and for two weeks after they had left the river and the vicinity of its banks. At times the birds seemed quite friendly, and would come down to the lower branches of a tree, to inspect the "onlookers," flying at times so near to one that to dodge was irresistible, and the most natural thing to do. No effort was

made to collect any of these birds, though one specimen was brought in to me, which gave an opportunity to clinch the previously made (field) diagnosis.—ADA B. COPELAND, *Grand Junction, Colo.*

Concerning Brewster's Warbler.—Additional notes on Brewster's Warbler in the July Auk (pp. 481 to 482) by Walter Faxon have much interest. In reading them I notice that he has not touched on one aspect which may not be clear to those unfamiliar with the laws of alternative inheritance.

Supposing, as we do, that where as Brewster's Warbler is the dominant, Lawrence's is the recessive hybrid, it could not be obtained from a cross in which one of the parents was a pure-lineage bird of either species, as the white under parts of *Vermivora chrysoptera* or the lack of throat patch of *pinus* would dominate in every such case. The comparative abundance of *chrysoptera* in the region under discussion makes it probable that the Golden-wings observed mated were pure.

Judicious shooting of *chrysoptera* over the *leucobronchialis* locality would probably induce sufficient *leucobronchialis* interbreeding, so that we would have the final chapter in this interesting colony; an heroic measure perhaps, but doubtless more specimens are frequently taken with less return to science. To interfere with *pinus* would be unwise, as the sporadic occurrence of that species in the Golden-wing's range places it in the position of the goose that layed the golden eggs.—J. T. NICHOLS, *New York, N. Y.*

Brewster's Warbler in Pennsylvania.—Noticing the references to Brewster's Warbler (*Vermivora leucobronchialis*) in Massachusetts in the October number of 'The Auk' I am reminded that its occurrence in Pennsylvania in May, 1916, has not been recorded in this publication. On May 20, 1916, a male specimen was observed on the north shore of Pocono Lake, Monroe Co., Pa., by Messrs. Wm. L. Baily, John Carter, Samuel Scoville, J. Fletcher Street and the writer. The bird was feeding among briars and other low bushes in an overgrown clearing in woods bordering an alder swamp, and was so accommodating as to allow us an unlimited observation at close range.—G. H. STUART 3RD, *Philadelphia, Pa.*

Blackpoll Warbler Lingerin in Mass.—I had thought that the climax of the most backward spring migration I have ever known had come when I heard singing, and subsequently saw at close range, a Blackpoll Warbler in Cambridge Common on June 25 of this year, eighteen days later than any record in Brewster's 'Birds of the Cambridge Region.' However, on July 7 I observed one singing on Quarry Point, Cohasset, Mass., and subsequently recorded him regularly, though with decreasing frequency during August, as he sang less and less, and was practically undiscoverable when not singing, in spite of the fact that he appeared to

keep to an area of not over twenty acres in the center of the point. Though I watched his movements closely for considerable periods I could never discover that he approached any nest, had a mate or young, nor did a search of the small cedars, pitch pines, and bushes of the area reveal them. I must conclude therefore that he was a stray, probably straggling north very late indeed and possibly stopped by the ocean lying immediately north for some twenty miles. I heard and saw him for the last time on August 27, though he may well have remained there until the fall migration.—ARTHUR C. COMEY, *Cambridge, Mass.*

Labrador and Acadian Chickadees at Hatley, Stanstead County, Quebec.—On the early and no doubt record date of September 3, two examples of the Labrador Chickadee (*Penthestes hudsonicus nigricans*) were obtained and three others noted between then and the twenty-first, whilst on October 11 two examples of the Acadian (*Penthestes hudsonicus littoralis*) were seen at close quarters and easily identified from the former, not so much from the fact of their backs being brown instead of dusky, the caps undifferentiated, and the sides of a strong brown tint, but more from their behavior and the tone of their voice, which was entirely different to that of the sixteen *nigricans* I have so far come across. The same wheezy note was certainly there, but it was stronger and more insistent than in *nigricans*, which has a very feeble wheeze. As regards their behavior they came close down to me of their own accord and when whistled, the same as *atricapillus* will, a thing I have never known *nigricans* to do, in fact it has always been a matter of much difficulty to get a shot at these latter owing to their restless and nervous state.—H. MOUSLEY, *Hatley, Que.*

Willow Thrush in Pennsylvania.—I wish to report the finding of a male specimen of Willow Thrush, *Hylocichla fuscescens salicicola*, August 28, 1913, in Capitol Park, Harrisburg, Penna. This bird had evidently struck a wire as was indicated by a mark found when the bird was skinned. The skin I sent to Mr. Harry C. Oberholser of the U. S. Biological Survey, Washington, D. C., who identified it as the Willow Thrush. It is now in the collection of the Pennsylvania State Museum. There is no previous record of this subspecies occurring in Pennsylvania.—BOYD P. ROTHROCK, *State Museum, Harrisburg, Pa.*

Subsequent Nestings.—I was very interested in reading an article by Mr. Mousley on subsequent nestings, (*Auk*, October, 1917). I have seen many interesting cases, and find that most birds will lay two or three sets of eggs in succession, but the most persistent pair of birds I have ever seen, were a pair of White-rumped Shrikes.

I first made the acquaintance of these birds on the 16th of May, 1916, at the Fairview Cemetery at Wahpeton, North Dakota. The second of

June I saw the birds feeding five young ones, and a few days later, I found the nest, where the young were raised. The nest was placed in the lower branches of a cottonwood about ten feet from the ground. April 1, 1917, the birds were back in their old haunts, and on April 15, they had finished repairing the old nest. April 23, I collected a set of six fresh eggs. The shrikes then moved away about two hundred and fifty feet and repaired a last year's robin nest. The ninth of May I looked into the nest and found five fresh eggs. This nest was placed twenty feet from the ground. Two or three days later the nest blew down or was torn down.

One week later a new nest was built, also in a cottonwood six feet from the ground. It contained three eggs. Laborers went to work trimming the trees and by cutting off the lower branches, the nest was destroyed. June 2 a new nest was found in a cottonwood fifteen feet from the first nest. It contained six fresh eggs.

I collected this set, and the birds again went to work, this time repairing an old nest of a Brown Thrasher. This nest was about seventy feet from Nest No. 1 and five feet from the ground. It contained on the fifteenth of June a set of six fresh eggs.

I had robbed the birds of two sets of eggs and had seen two sets lost by accident, and however interesting it might have been to carry the experiment farther, I could not do it, so I watched the birds raise a family of six healthy young.

I have now in my collection two sets or twelve eggs of these birds and had an opportunity to see fourteen eggs more, and I found them all so near alike, that it would be impossible to pick out the different sets, if the eggs became mixed.

When I found the first nest the birds would stay near by, whenever I went to examine it. Later they grew so bold, that if I came near the nest, they would fly at me screaming and biting, one even causing me a bleeding wound on my hand.

As the country is level, open, almost treeless, and I did a good deal of exploring, I feel certain that these were the only pair of shrikes in this locality, and that I could not possibly have overlooked another pair of birds.—J. K. JENSEN, *U. S. Indian School, Santa Fe, New Mexico.*

Uncommon Birds at Hatley, Stanstead County, Quebec.—It may be interesting to record the fact of having found the Red-headed Woodpecker (*Melanerpes erythrocephalus*) breeding here this summer, the nest being in a dead maple tree at the roadside about fifteen feet above the ground, and when found on July 16, containing four young birds which left the nest between July 31 and August 4. During the same month, and whilst on my way to visit the above nest I came across an example of the Turkey Vulture (*Cathartes aura septentrionalis*) on July 31, which I was enabled to follow about in a large wood for some considerable time and thoroughly identify. Two months later, or on September 24, whilst hunt-

ing in "the marsh" I was fortunate enough to secure a fine example of the Green Heron (*Butorides virescens virescens*) and shortly after whilst visiting a farmer in the district I was shown a mounted example of the Black-crowned Night Heron (*Nycticorax nycticorax naevius*) which he had shot some eight years ago at Fitch Bay about twelve miles from Hatley. At another house I was shown a mounted male example of the Arctic Three-toed Woodpecker (*Picoides arcticus*) which was shot about two years ago in the fall near Massawippi, all these five birds being new to my list.—H. MOUSLEY, *Halley, Que.*

Early Bird Records for the Vicinity of Washington, D. C.—The Bulletin of the Proceedings of the National Institute for the Promotion of Science contains numerous records of birds collected near Washington, most of which are the earliest published for the region. Those worth recalling to attention are: *Larus eburneus*¹ (= *Pagophila alba*), not otherwise recorded; *Fuligula perspicillata* (= *Oidemia*), meeting of February 14, 1842,² a record sixteen years prior to the earliest cited by Professor W. W. Cooke; *Fringilla nivalis* (= *Plectrophenax*), meeting of March 14, 1842,³ for which there are only two other records, the next in 1886; *Thalasidroma leachii* (= *Oceanodroma leucorhoa*) and *T. wilsonii* (= *Oceanites oceanicus*), meeting of September 12, 1842,⁴ now known to have been taken the previous month after a violent northeast storm; at the same meeting *Puffinus cinereus* (probably = *P. griseus*), the only record for a shearwater for the region; *Fuligula glacialis* (= *Harelda hyemalis*), meeting of November 14, 1842,⁵ and earlier record by fourteen years than any cited by Professor Cooke; and *Ortygometra noveboracensis* (= *Coturnicops*) "said to be the only one ever found in this District, killed on the Potomac River, opposite Washington — From George Washington Custis," meeting of November 13, 1843,⁶ an addition to the three records listed by Professor Cooke, and thirty-six years earlier than the oldest of them.—W. L. McATEE, *Washington, D. C.*

¹ Second Bull., Meeting of January, 1842, p. 134.

² Second Bull., p. 148.

³ Third Bull., p. 224.

⁴ Third Bull., p. 251.

⁵ Third Bull., p. 262.

⁶ Third Bull., p. 320.

RECENT LITERATURE.

Herrick's 'Audubon The Naturalist.'¹—Most of us have come to feel that we are so thoroughly conversant with the life of Audubon, many of us having prepared brief biographical sketches or addresses in connection with the numerous societies which bear his name, that we are apt to look upon a "new life" of the naturalist as necessarily a work of supererogation—a redressing of a well worn theme. If anyone open Prof. Herrick's volumes with such an idea in mind, he will very soon be disabused of it. Almost from the first page we realize that here at last is the real life of Audubon beside which all previous efforts fall into insignificance.

Not only is there a vast amount of new data covering the blanks in the accounts of former biographers, rounding out many incidents and correcting many errors, but the whole treatment is that of the disinterested, unprejudiced biographer and scholar. Previous sketches of the naturalist's life when carefully analyzed are found to be largely based upon his own brief autobiography, apparently written for his children, without reference to documents and hence relying mainly upon memory, with inevitable lapses and errors. Most of the estimates of his character and achievements too, are to a greater or less extent tinged with the spirit of hero worship, that such a lovable, picturesque and magnetic man as Audubon was bound to arouse even in those who knew him only through his writings and paintings. Prof. Herrick on the contrary has, we think, maintained an eminently just attitude throughout his work, as behooves the good biographer; always thoroughly in sympathy with his subject, praising his achievements, and yet frankly admitting his errors. The result is that after reading these volumes we seem to know Audubon better than we ever did before and to have a still better appreciation of him.

When we realize what Prof. Herrick has accomplished in tracing out the life of Jean Audubon, father of the ornithologist, and ascertaining the date and place of birth of the latter as well as the identity of his mother,—all of which were previously involved in obscurity, we wonder why no one ever made the attempt to solve these problems before, and why we were content to conclude that the last word had been said upon the life of this remarkable man.

Prof. Herrick realizing the inadequacy of existing biographies and the need of much additional original information systematically set about searching for it, with the result that he finally discovered in France the

¹ Audubon, The Naturalist. A History of his Life and Time. By Francis Hobart Herrick, Ph. D., Sc. D., Professor of Biology in Western Reserve University; Author of "The Home Life of Wild Birds," etc. In two volumes. Illustrated. D. Appleton and Company. New York and London, 1917. Svo. Vol. I, pp. i-xl and 1-451. Vol. II, i-xiii and 1-494. Price, \$7.50 net.

greater part of the manuscripts, letters etc., of Jean Audubon, still in the possession of the family which had inherited his widow's estate. With this material it was possible to clear up all the doubts regarding the birth of the ornithologist and to sketch in detail the life of his father. We now learn that Audubon was born on April 26, 1785, not May 5, 1780, as is usually stated; and that the place of his birth was Les Cayes on the southern coast of Haiti not in Louisiana, while his mother proves to be a French creole, one Mlle. Rabin.

Continuing his researches Prof. Herrick brought to light many unpublished letters and documents in the possession of the descendants of Rozier, Audubon's business partner during his early life at Mill Grove and in Kentucky. These shed much interesting light upon this period of the naturalist's history. The well known collections of Auduboniana belonging to Mr. Joseph Y. Jeanes, of Philadelphia, Mr. Ruthven Deane, of Chicago, Col. John E. Thayer of Lancaster, Mass., and Harvard University, were carefully studied and all printed matter relating to Audubon has been consulted.

With the results of his researches extending over ten years, thoroughly digested, Prof. Herrick has written his notable biography,—or better, history, for it is far more than a biography, following out as it does so many side lines in chapters replete with interesting historical information relating to many persons, places and events only incidental to the main theme. The work abounds in detailed information, with foot-notes full of references and exact quotations, and an abundance of illustrations — photographic reproductions of historical documents and early sketches, portraits of Audubon and of various persons mentioned in the text, as well as views of buildings and places associated with the life of the ornithologist. There are also several reproductions in colors of some of the plates of the 'Birds of America.' A series of appendices contain copies of original documents of all sorts; a list of original drawings by Audubon which are still extant; a list of the subscribers to the 'Birds of America'; a list of the authentic likenesses of the ornithologist and a bibliography of two hundred and thirty-four titles of which Audubon's own contributions are seen to number but thirty-seven all told.

This brief resumé will give some idea of the scientific and historical value of the book. But it has other merits as well. Prof. Herrick has the happy faculty of writing history and biography in a manner that is not only eminently scholarly but exceedingly interesting and as a result we have in these two volumes a delightfully entertaining piece of literature, which will appeal to many who may care little for Audubon as an ornithologist.

It would be manifestly impossible in the short space of a review to call attention to all the original matter presented by Prof. Herrick and everyone interested in Audubon must read the volumes for himself. Mention may however be made of certain chapters, dealing with the character of the man, which has always been a matter of foremost interest.

In that dealing with Audubon's 'Episodes of Western Life,' Prof. Her-

rick has published some interesting parallel accounts by other writers of incidents described by the ornithologist, which differ widely as to detail. He says in commenting upon this discrepancy, "Whenever Audubon went directly to nature to exercise his pencil or brush or wrote with his subject before him, he was truth itself, but in writing offhand and from memory of past events he was wont to humor his fancy disregarding dates as readily as he did the accents on French words."

A striking example of this carelessness is seen in his unfortunate article 'Notes on the Rattlesnake,' which brought forth such bitter attacks upon his veracity as a naturalist. This remarkable account describes the venomous reptile pursuing a Gray Squirrel through the branches of a tall tree and eventually capturing it after leaping to the ground after it. This remarkably detailed account, says Prof. Herrick, "could not possibly have been an invention for it is strictly and minutely in accordance with facts except in one important particular; the snake whose behavior Audubon watched and so accurately described was not a Rattlesnake but the Blue Racer or Black Snake . . . by some curious twist of his notes or memory the species became confused in his published account."

This peculiar trait so well appreciated by Prof. Herrick, has to our mind been at the root of all the unfortunate controversies over Audubon's work as well as of the so called "rivalry" between Audubon and Wilson, which of course did not begin until long after the latter's death. To the scholarly closet naturalist like George Ord, as to anyone trained in the painstaking accuracy of systematic natural history, the freedom and looseness of Audubon's style, the "poetic license" with which he handled scientific matters, was utterly repugnant. They could recognize no natural history but that fostered in the museum. John Cassin, another closet ornithologist had exactly this same idea of what constituted a naturalist and as he never showed any prejudice against Audubon and indeed seems to have been rather friendly disposed towards him, it is interesting to note his opinion of him, which by the way Prof. Herrick does not seem to have given. He met Audubon at the Philadelphia Academy in June, 1845, and wrote to Baird on the twenty-third of that month: "Audubon has been here — do not particularly admire him — is no naturalist — positively not by nature — an artist no reasonable doubt of it."¹

So the estimates of Audubon will probably vary for all time to come according to the personal temperament and attitude of mind of his critics.

As to the Audubon and Wilson "controversy"; to anyone who has carefully and impartially studied the lives and characters of the two men the idea of comparing them by the same standard of judgment is utterly preposterous. They represented entirely different sides of ornithological study and one might as well try to argue, in these days of extreme specialization, who is the greatest living ornithologist, as to say that either of these men was greater than the other.

¹ Leading American Men of Science, p. 80.

That Prof. Herrick's volumes contain references to all the existing matter relating to the ornithologist we doubt, and he would probably be the first to admit this possibility. The very amount of material, astonishing as it is, that he has gathered together only makes it more probable that there are yet other published notes and manuscripts undiscovered, but they are not likely to alter in any material way the history that he has written, even while his pages were going through the press several notes have appeared in print, among which we may mention the description of Audubon republished by John H. Sage in 'The Auk' (April, 1917, p. 239). Another article in the same journal 'Miss Lawson's Recollections of Ornithologists' by F. L. Burns (July, 1917, p. 275), corrects a statement regarding Wilson which we notice Prof. Herrick has perpetuated, *i. e.* referring to "his fingers stiffened by the hard labor of his hands." This we always thought to have been a fiction of some of his biographers, as he wrote a beautiful hand, played skilfully on the flute and worked at the loom, none of which accomplishments accord well with "hands knotted and hardened by labor," these points Miss Lawson emphasizes adding that her mother spoke of Wilson's hands as small and delicate.

In closing, we should like to emphasize in the strongest terms Prof. Herrick's plea for the restoration and preservation of the dwellings of Audubon and his sons in New York City which "though in dire neglect, are not beyond repair," and that the ground where they stand, between Riverside Drive and the Hudson River, should be converted into a real Audubon Park. As he truly says "such a memorial would contribute to the instruction and pleasure of all the people, for every generation of Americans that is to come" — and we may add that this closing sentence of Prof. Herrick admirably describes the volumes that he himself has given to the public, the contents of which we have here endeavored to describe.—
W. S.

The New 'Birds of America.'¹—The present work the publishers tell us in the preface is put forth to meet the demand for a single work which will present "a complete review of what is known today about American birds." While this is a pretty large task even for the imposing array of authors and artists whose names appear on the title page to say nothing of the advisory board of nineteen more, nevertheless we think that the work will fill a very general need. It is by all odds the most thoroughly illustrated work on North American birds that has yet appeared and the great demand for the admirable colored plates of Mr. Fuertes, which

¹Birds of America. Editor-in-Chief, T. Gilbert Pearson; Consulting Editor, John Burroughs; Managing Editor, George Glidden; Associate Editor, J. Ellis Burdick; Special Contributors, Edward H. Forbush, Herbert K. Job, William L. Finley and L. Nelson Nichols. Artists, L. A. Fuertes, R. B. Horsfall, R. I. Brasher and Henry Thurston. The University Society Inc. New York (1917). Vol. I, pp. i-xviii, + 1-272; Vol. II, pp. i-xiv, + 1-271; Vol. III, pp. i-xviii, + 1-289. 4to, numerous illustrations, and 110 colored plates. Comprising Volumes I-III of the 'Nature Lovers' Library'.

appeared in Eaton's 'Birds of New York,' indicated pretty clearly what the bird-studying public wants, for it is far easier to identify birds from good colored plates than from any amount of descriptions. The publishers of the present work have been fortunate in obtaining these same plates through the courtesy of the New York State Museum, and they naturally form one of the leading features of the volumes. Mr. Henry Thurston has contributed a series of five colored plates of birds' eggs which are very satisfactory. Then there are a large number of half-tone text figures of birds from colored drawings by Mr. R. I. Brasher which vary considerably in merit, but they are all minutely exact in patterns and markings and are therefore often of greater value for purposes of identification than certain much more artistic and lifelike bird portraits. Besides all of these there are a very large number of reproductions of photographs mainly from nature but some from mounted specimens, although the fact is not always mentioned, and some of paintings by Mr. Bruce Horsfall. Most of this last group of illustrations have already appeared in other publications and are from a variety of sources.

We regret that the publishers have seen fit to adopt the name of Audubon's classic work as their title. Every work must stand upon its own merits and it is a pity that each one cannot have a distinctive name. In one respect the present work is like its great predecessor — that is in the unequal treatment of the birds of the two sides of the continent. Audubon of course did not possess adequate information on western birds but in the present case that excuse does not exist and we fear that western ornithologists will resent the fact that while all of the eastern birds are figured in colors not one of the distinctively western species is so depicted, most of them being pictured only in half-tones and quite a number not at all. The superabundance of figures of some of the eastern species on the other hand seems unnecessary, if not actually confusing. With Fuertes' excellent full page plate of the Blue Jay, it is quite unnecessary to publish a figure by Brasher which shows nothing additional, to say nothing of a very poor photograph of what is apparently a mounted bird.

However these criticisms in no way detract from the fact that this work places within reach of the public a splendid series of bird pictures, more and better than can be gotten today in any other work, which will go far to satisfy the needs of a vast number of bird students and no doubt help to develop many a future ornithologist.

The text is admittedly, in the main, compiled, and most of the accounts are satisfactory, presenting concisely such information as one would desire on habits, range, food, etc. The best accounts are probably those by Herbert K. Job and Edward Howe Forbush. The nomenclature is that of the American Ornithologists' Union Check-List and subspecies are only mentioned at the end of each account, where the points by which they differ are briefly stated and their ranges given, often too briefly to be of much practical value. Curiously enough the name of the eastern race is always given in the heading. This may be logical where, as is usually the case,

it is the so called 'typical' form, as for instance *Planesticus migratorius migratorius*, for the Robin, but in the case of the Hermit Thrush it would seem more consistent to have headed the text with *Hylocichla guttata guttata* than with *H. g. pallasii*. This however simply shows the need that has recently been emphasized of a binomial nomenclature for popular ornithology and a vernacular name for each binomial group. Then we should have had for a heading in the case referred to *Hylocichla guttata* the Hermit Thrush, and if subspecies were to be mentioned at all, their trinomial names could have been given in the end of the text along with their characteristics and ranges. This is a fault of the A. O. U. Check-List, however, and not of 'The Birds of America.'

At the head of each account is given a list of vernacular names; a general description and detailed account of coloration; a description of the nest and eggs; and the range of the bird. This information is taken from Ridgway's 'Birds of North and Middle America' and the A. O. U. 'Check-List,' popularized where necessary by the alteration of technical terms. There are several color keys at the end of the work, a glossary and a bibliography. The last is rather an unfortunate effort, as remarkable for what it omits as for what it includes and with no indication of what the various books treat. There should at least have been a geographical list of works on the bird life of the several states, since the first thing the general reader will desire, after having his interest aroused by a work of this kind, is a special publication on the birds of his own region.

The paper upon which the work is printed is heavily sized in order to carry the large number of half-tone figures, which makes it exceedingly heavy, but the typography is good and the printing of both text and plates well done as is also the binding, making all in all an exceedingly attractive work.—W. S.

'Tropical Wild Life in British Guiana'.¹—This volume published by the New York Zoölogical Society, presents the results of the first season's work at the tropical research station, established in British Guiana under the direction of William Beebe and conducted by him from March to August, 1916. The enterprise marks an innovation in tropical zoölogical research, making possible the study of living or freshly killed tropical animals in their native haunts, whereas heretofore field work has of necessity been mainly limited to securing and preserving specimens to be studied by specialists in museums, far distant from the home of the animals them-

¹ 'Tropical Wild Life in British Guiana. Zoölogical Contributions from The Tropical Research Station of The New York Zoölogical Society. By William Beebe, Directing Curator, G. Inness Hartley, Research Associate and Paul G. Howes, Research Assistant, with an Introduction by Colonel Theodore Roosevelt. Volume I. Photographs and Other Illustrations by the Authors. Published by the New York Zoölogical Society, 111 Broadway, New York City. January, 1917 [distributed in November]. 8vo. pp. i-xx + 1-504, 4 colored plates and numerous half-tone illustrations.

selves. It is in fact an extension of the idea of the marine zoölogical laboratory, made familiar by the Wood's Hole and other stations.

The practicability of the plan may be realized when we read of the commodious and thoroughly equipped laboratory and dwelling which Mr. Beebe and his companions established, and in which they carried on their researches, on the very edge of the jungle and yet with no more inconveniences than would be met with in similar establishments in the United States — working hard “day after day, month after month, unpoisoned, unbitten and in good health.”

The work is divided into four parts: I. General and Ecological, by William Beebe; II. Ornithological, by G. Inness Hartley; III. Entomological, by Paul G. Howes; and IV. Supplementary Chapters — on the Hinterland of Guiana, by Rev. Walter G. White and on Indian charms by James Rodney. Mr. Beebe's narrative chapters are extremely interesting and give one an intimate picture of life in the jungle, while they teem with important ornithological information. At one point the birds are arranged according to their vertical habitat in the forest, at another brilliancy of plumage is considered in its relation to intensity of light. Protective coloration naturally comes in for considerable attention and in this connection Mr. Beebe adopts the apparently original criterion of regarding a bird as not protectively colored — “at least in its own intensive estimation” — if it takes immediate flight on the approach of a supposed enemy; while the bird is so protected which attempts concealment by squatting or “freezing”. Emphasis is placed upon the need of an intimate knowledge of the natural environment and habits of a species before any judgment is possible as to the protective value of its coloration.

The habits of the Hoatzin are described with great detail with photographs of the nest and eggs and the downy nestlings climbing about “on all fours” as it were.

Our knowledge of the nest, eggs and young of the Toucans has been as Mr. Beebe well puts it, “almost a blank”; and yet he was able in two months time to obtain data on the nidification, of five species and to study carefully the development of the young. They have curious thickened heel pads armed with conical tubercles by means of which they are able to drag the body along, the toes remaining functionless for quite a long time. Similar heel pads have been noted in other birds which nest in holes, and which probably have a similar method of locomotion during their nestling stage. The nesting habits of the Tinamous of the genus *Crypturus*, as described, are most interesting. The male, it seems, makes the nest and attends to all the duties of incubation, the female's entire interest in the matter being to deposit the egg, after which she departs possibly to perform the same favor for some other male who has a nest ready. The male having hatched the single egg prepares another nest and awaits “another temporary mate of advanced feminist views.” The process seems to be continuous.

Mr. Hartley's contributions to the volume consist of laboratory studies

covering the development of the Jacana and Ani and elaborate studies of the development of the several parts of the bird's wing, from embryo to adult, in a number of species. There is also a study of a Grey-breasted Martin colony which occupied a box near the laboratory.

One must read the book to appreciate the amount of interesting and suggestive data that it contains. With such results in the first season we may confidently look for greater success in the future, and with the experience gained in 1916 Mr. Beebe should be able to plan definitely for the solution of certain problems when he makes his next visit to "Kalakoon House." The science of zoölogy and ornithology in particular is deeply indebted to the six members of the New York Zoölogical Society whose liberality made the establishment of this station possible, while hearty congratulations are due Mr. Beebe and his staff upon the manner in which they have availed themselves of the opportunities that were offered them.—W. S.

Catalogue of the Childs Library.¹—In this handsomely printed volume Mr. John Lewis Childs presents a catalogue of his well known library. Nearly one third is devoted to ornithological works, following which are the parts relating to various other branches of natural history. Mr. Childs' series of large illustrated folios is very complete, including the Shattuck copy of Audubon's 'Birds of America,' Elliot's monographs, Gould's 'Hummingbirds', etc. We notice one unique volume of especial interest, a series of original water colors of the commoner birds of Floral Park, by Alan Brooks and one additional plate depicting their eggs. A large number of separata are listed in the bound volumes of 'Ornithology'. The catalogue will be of especial interest to bibliographers and to those who wish to ascertain the extent of their own desiderata.—W. S.

Preliminary List of the Birds of Tennessee.²—This little pamphlet consists of a list of 270 species with a very brief mention of the character of their occurrence in west, middle and east Tennessee, in three parallel columns. According to the 'fore word' it is compiled to serve as a working basis for the collecting of data from which the Tennessee Ornithological Society expects, in due time, to prepare an authoritative list of the birds of the state. Only English names are used but these follow the nomenclature and order of the A. O. U. 'Check-List'. The list seems well calculated to serve its purpose and presumably the compiler has consulted most of the meagre literature dealing with the birds of Tennessee, but as he states that "the published material consists of a few local lists covering

¹ Catalogue of the North American Natural History Library of John Lewis Childs, Floral Park, New York. Published by John Lewis Childs, Floral Park, New York. 1917. Small 4to, pp. 1-150.

² Preliminary List of the Birds of Tennessee. Compiled by the Tennessee Ornithological Society. 1917. Issued by the Department of Fish and Game, W. D. Howser, State Warden. Nashville, Tenn. 8vo, pp. 1-28.

chiefly the mountainous section," lists covering neighboring States and publications of the U. S. Biological Survey, we cannot help but wonder whether he is familiar with the most important of all the Tennessee lists, that of Saml. N. Rhoads, published in the 'Proceedings of the Philadelphia Academy' for 1895, which furnishes data on no less than 215 species. There is also an interesting paper on Tennessee birds by Bradford Torrey in the 'Atlantic Monthly' for February, 1896.—W. S.

Birds of Carthage, Illinois.¹—Carthage College has published a list of the birds of Hancock County, Ill., compiled by the members of the bird class under the direction of Prof. F. C. Gates. 155 species are listed with the dates on which they were seen. Appended is a list of specimens in the college museum.—W. S.

Swarth and Bryant on the White-fronted Geese of California.²—The writers of this interesting contribution to our knowledge of the American geese were led to make an investigation of the White-fronted Geese of California by the statements of Mr. Geo. Neale and Judge F. W. Henshaw, to the effect that there were two forms of these birds, a large one and a small one. Subsequently specimens were presented by the same gentlemen to the Museum of Vertebrate Zoölogy at Berkeley, Cal., which fully substantiated their claim. A thorough examination of a large number of birds, as well as the literature of the subject, has led the authors to the following conclusions. The existence of two perfectly distinct races of White-fronted Geese in North America has been overlooked by all writers on the subject and the discrepancy in the size of certain individuals has caused doubt as to the validity of the race *gambeli* as distinct from *albifrons* of the Old World. As a matter of fact the former was based on the large American bird while the smaller form, which seems to be by far the commoner is nothing more than the true *albifrons* hitherto supposed to be restricted to the Old World except as a doubtful straggler to Greenland. The authors have done a good piece of work and the only fault that we have to find with their paper is the rather careless use of the word "species" when they mean subspecies. The term "form" seems to be the only word available where we are forced to discuss both species and subspecies at the same time. Possibly this ambiguity may have had something to do with the apparent perplexity of a reviewer in a recent issue of 'The Oölogist' who charges the authors with describing a new subspecies, a "crime" which they studiously avoided.—W. S.

¹ Bird Number. Carthage College Bulletin. Vol. III, No. 11. April, 1917, pp. 8.

² A Study of the Races of the White-fronted Goose (*Anser albifrons*) Occurring in California. By H. S. Swarth and Harold C. Bryant. Univ. of Cal. Publications in Zoölogy. Vol. 17, No. 11, pp. 209–222. October 19, 1917.

Oberholser on the Subspecies of Leach's Petrel.¹—No less than three petrels of this group have been described from the western coast of North America.—*Oceanodroma kaedingi*, *beali* and *beldingi*. Difference of opinion has prevailed as to their relationship to one another as well as to *O. leucorhoa*. After the study of a large series of specimens including the types of all the west coast forms, Mr. Oberholser comes to the conclusion that true *leucorhoa* is found in the North Pacific as well as in the Atlantic. That *O. beali* is recognizable as a smaller subspecies ranging from southeastern Alaska to California and that *O. kaedingi* is a still better marked subspecies occurring off the coast of Lower California. *O. beldingi* he cannot separate from *beali*. It will be interesting to see whether his conclusions will be endorsed by others or whether a still different conclusion will be reached by the next student of the group. Certainly he has presented the most careful and detailed study that has yet been offered.—W. S.

Oberholser on Birds from Islands in the Java and China Seas.—The first of these papers² covers collections from four islands, Solombo Besar, Arends, Pulo, Mata Siri and Pulo Kalambau. Fourteen new forms are described as well as one new genus, *Perissolalage* (p. 182) type *P. chalepa* sp. nov., from Solombo Besar, based on a single female. Another more extended paper³ treats of the birds of the Anamba Islands, fifty-six in number, of which nineteen are new subspecies here described for the first time. All the collections were made by Dr. W. L. Abbott.—W. S.

Paxson on the Last of the Wild Pigeon in Bucks County, Pennsylvania.⁴—Col. Paxson has spent much time in gathering the data contained in this interesting paper and is to be congratulated upon publishing it and thus placing it on permanent record. Upon glancing over the pages we realize what an amount of information can be gathered by interviewing old pigeon trappers and hunters, and are surprised that more intelligent research along these lines has not been conducted. Some of the information gathered in this manner is probably of no great value but much of it is extremely interesting and when we realize that not only is the last pigeon dead, but that every year the men who formerly hunted the bird are becoming fewer and fewer, we appreciate work of the sort that has resulted

¹ A Review of the Subspecies of the Leach Petrel, *Oceanodroma leucorhoa* (Vieillot). By Harry C. Oberholser. Proc. U. S. Nat. Mus., Vol. 54, pp. 165-172. Published October 19, 1917.

² Birds Collected by Dr. W. L. Abbott on Various Islands in the Java Sea. By Harry C. Oberholser. Proc. U. S. Nat. Mus., Vol. 54, pp. 177-200. November 2, 1917.

³ The Birds of the Anamba Islands, Bull. 98, U. S. Nat. Mus., pp. 1-75, June 30, 1917 [not received until November.]

⁴ The Last of the Wild Pigeon in Bucks County. A Paper by Henry D. Paxson. Read at the Fall Meeting of the Bucks County Historical Society, held at Chalfont, Bucks County, Pennsylvania, Tuesday, October 22, 1912. [Printed October, 1917.] 8vo, pp. 1-18.

in the little pamphlet before us, and wish that others would take steps to gather together their local Wild Pigeon lore before it is too late. A half-tone plate figures the Cincinnati pigeon, the last survivor, shortly before its death, and the last Pennsylvania pigeon shot on October 2, 1895, now in the possession of Mr. George H. Stuart, 3rd.—W. S.

Peters on Birds from Santo Domingo.¹—Mr. Peters spent about two months (February 6–April 11) in 1916, on an ornithological reconnaissance of the northern coast of Santo Domingo, in the interests of the Museum of Comparative Zoölogy. A collection representing ninety-two species was the result and it is described in detail in the present paper. No new forms are proposed but the relationship of the San Domingo birds to allied species is discussed, important field notes are presented and by way of introduction there is a comprehensive review of the literature of the ornithology of the island. Altogether Mr. Peters' paper forms one of the most important contributions to our knowledge of the bird life of this rather neglected island.—W. S.

Recent Papers by Gyldenstolpe.²—In the 'Arkiv för Zoologi' of the Swedish Academy, Nils Gyldenstolpe has published an account of collections of birds from Bukit Tangga and Lower Perak in the Malay Peninsula and another important article on the heel pads on the tarsus of various birds—Toucans, Woodpeckers, etc., with drawings showing the extent of their development.—W. S.

Cary's 'Life Zone Investigations in Wyoming.'³—This report is based upon the field work of the author since 1909 as well as that of numerous other members of the Biological Survey. The greater part is devoted to a detailed consideration of the several life zones of the state; their boundaries, subdivisions and characteristic animals and plants.

The bird matter is restricted entirely to the lists of breeding species under the several zones, but there is an annotated list of the trees and shrubs at the end of the report. An excellent colored faunal map completes what will be a most welcome and helpful publication to anyone undertaking scientific field work of any kind in Wyoming.—W. S.

Third Report of the Meriden Bird Club.⁴—The report of this well known club of which Mr. Ernest Harold Baynes is the General Manager—

¹ Birds from the Northern Coast of the Dominican Republic. By James L. Peters. Bull. Mus. Comp. Zool., Vol. LXI, No. 11. October, 1917. pp. 391–426.

² On Birds and Mammals from the Malay Peninsula. By Nils Gyldenstolpe. Arkiv. för Zoologi. K. Svensk. Vet. Akad. 10, No. 26. pp. 1–31. February 8, 1917.

³ Life Zone Investigations in Wyoming. By Merritt Cary. North American Fauna, No. 42 Biological Survey, U. S. Dept. of Agriculture. October 3, 1917. pp. 1–95, map and numerous half-tone illustrations.

⁴ Third Report of the Meriden Bird Club. 1916. 8vo, pp. 1–108 + 6.

the parent of 'Bird Clubs' in fact, is always interesting. In this issue we find a full account of the Masque Sanctuary written especially for the Meriden Club by Percy MacKaye, first performed at Meriden on September 12, 1913, and since played in many parts of the country. More than anything else in recent years this play seems to have aroused public interest in bird conservation and it will interest everyone to read this account of its inception and production.

Among many other matters interesting to those engaged in the establishment of bird sanctuaries we find in this report a list of no less than 182 bird clubs which directly or indirectly owe their origin to the Meriden Club—a proud record for Mr. Baynes and his associates.—W. S.

Mathews' 'Birds of Australia'.¹—Part V, of Volume VI of Mr. Mathews' work continues the treatment of the Parrots, figuring ten species of *Psephotus* and allied genera. We notice on p. 391 a new subgenus, *Clarkona*, provisionally proposed for *Psephotus varius*, and on p. 408 two new subspecies, *Psephotus varius thela*, from Central Australia, and *P. v. orientalis*, from Underbool.—W. S.

Strong on the Origin of Melanin Pigment in Feather Germs.²—Dr. Strong finds that melanin pigment granules occur occasionally in the so-called cylinder and inner-sheath cells of feather germs from the Common Fowl, and obtains further evidence that this pigment is of epidermal origin.

He found melanophores in the dermal pulp of the feather germs, presumably homologous with the dermal melanophores of the skin. While some of these had processes they did not, apparently distribute pigment to other cells.—W. S.

Bird Conservation in 1917.—The bulky report of the National Association of Audubon Societies must be read by everyone interested in bird protection. When we read the lengthy lists of persons engaged in this work today we are dazed at the progress of the movement. With hundreds of bird clubs being organized in every part of the country, thousands of school teachers introducing instruction on bird protection in their classes, with bird lecturers on the Chautauqua circuits and exhibitions of bird houses, feeding shelves and other paraphernalia on every side, it will soon be as hard to find a person who is not affiliated with bird conservation in some way or other, as it was some years ago to find one who was willing to sign a pledge to abandon the use of birds in millinery.

The movement has certainly gotten far beyond the ability of 'The Auk'

¹The Birds of Australia. By Gregory M. Mathews. Vol. VI, Part V. September 11, 1917.

²Some Observations on the Origin of Melanin Pigment in Feather Germs from the Plymouth Rock and Brown Leghorn Fowls. By R. M. Strong. Anatomical Record, Vol. 13, No. 2, July, 1917. pp. 97-108.

to properly notice the publications which are appearing in its interests. We can only refer to the regular publications of the various Audubon Societies and Game Protective Associations which are listed in every issue, under 'Publications Received' and limit our notices to the less known or special publications.

Among those before us at present there is a creditable little pamphlet on 'Bird Study' by J. W. Hungate, issued by the State Normal School of Cheyney, Wash., and the attractive 'Year Book' of the Hartford Bird Study Club, Conn., while mention should be made of the Game Laws for 1917, issued by the U. S. Dept. of Agriculture which every hunter must have.—W. S.

Mullens and Swann's Bibliography of British Ornithology.¹—This valuable work has reached completion by the issue of part six. This together with part five which appeared some months ago contain some exceedingly interesting biographies. Gilbert White, Bowdler Sharp, Tristram, Salvin, Saunders, Seebohm and many others, are familiar names to American ornithologists, and it is a satisfaction to find out something about the details of their lives and achievements.

The complete volume forms a necessary work of reference for every ornithological library, while thanks to the efforts of the publishers, it is a piece of book making of which everyone may well be proud.—W. S.

The Ornithological Journals.

Bird-Lore. XIX, No. 5. September–October, 1917.

The Summer Life of the Virginia Rail. By Verdi Burtch.—With excellent photographic illustrations.

American Egrets in New York City. By Clark L. Lewis, Jr.—Three birds came to Van Cortland Park and remained for a number of weeks, one of them until October 10.

Nesting Habits of the Cliff Swallow. By Manley B. Townsend.—Seem to prefer unpainted buildings but not exclusively.

The plumages of the Barn Swallow and Martin are discussed by F. M. Chapman; with an attractive colored plate by Fuertes.

Bird-Lore, XIX, No. 6, November–December, 1917.

Winter Visitors to City Park, Denver, Colo. By J. D. Figgins.—Excellent photographs of the Bohemian Waxwing.

Taming the Evening Grosbeaks. By Edith K. Dunton.

A Remarkable Martin Roost in the City of Washington. By Harry C. Oberholser.

¹A Bibliography of British Ornithology from the earliest times to the end of 1912. By W. H. Mullens and H. Kirke Swann. Macmillan and Co., Ltd. London, 1917. Parts V and VI.

The Migration of North American Birds. By Harry C. Oberholser. Covers five species of swallows, and continues the work carried on in these pages for several years by the late Prof. Cooke.

Notes on the plumage of North American Birds. By Frank M. Chapman.— Completes the Swallows. An admirable plate by Fuertes accompanies the article.

The Educational Leaflet treats of the Pileated Woodpecker and the bulk of the number is taken up with the annual report of the Audubon Societies.

The Condor. XIX, No. 5. September–October, 1917.

Notes on the Nesting Habits of the Clarke Nutcracker in Colorado. By W. C. Bradbury.

Red Letter Days in Southern California. By Florence Merriam Bailey.

Botta's Visit to California. By T. S. Palmer.— An interesting historical paper fixing more accurately the type localities of the first birds described from California.

Some Birds of the Davis Mountains, Texas. By Austin Paul Smith.— An annotated list of 45 species.

A New Race of Fox Sparrow, from the Vicinity of Mono Lake, California. By Joseph Grinnell and Tracy I. Storer.— *P. i. monoensis*, with a slightly smaller bill than *P. i. megarhyncha* of the western slope of the Sierra Nevada.

The Wilson Bulletin. XXIX, No. 3. September, 1917.

The Birds of Denver. By W. H. Bergtold.— 187 species listed.

Horned Larks in the Province of Quebec. By L. McI. Terrill.

Annotated List of the Water Birds, Game Birds and Birds of Prey, of Sac County, Iowa. By J. A. Spurrell.

The Oölogist. XXXIV, No. 9. September, 1917.

Some Interesting Birds of the Judith Basin, Montana. By P. M. Silloway.

Nesting of the Prairie Horned Lark [in Mass.]. By H. O. Green.

Bendire's Crossbill [Nesting] in Kansas. By A. S. Hyde.

The Oölogist. XXXIV, No. 10. October, 1917.

Bird Collecting in Eastern Colombia. By Paul G. Howes.— Continued in November.

The Ibis. X Series. V, No. 4. October, 1917.

On a New South American Jay of the Genus *Cyanolyca*. By W. L. Slater.— *C. viridicyanea cuzcoensis* from Cuzco (p. 465).

Notes on the Birds of Malta. By G. Despott.— Concluded, total number of species 341.

Birds of the Ancre Valley [France]. By Lt. J. N. Kennedy.

Birds of the Suez Canal Zone and Sinai Peninsula. By Capt. A. W. Boyd.

Further Notes on the Birds of the Province of Fohkien in Southeast China. By J. D. D. La Touche.

The Birds of Dirk Hartog Island and Peron Peninsula, Shark Bay, Western Australia, 1916–17. By T. Carter; with Nomenclature and

Remarks by G. M. Mathews.—*Calamanthus campestris peroni* (p. 586) subsp. nov. *Oreoica cristata lloydi* (p. 608).

Bulletin of the British Ornithologists' Club. CCXXVII. October 30, 1917.

The following new forms are described: By Lord Rothschild, *Melanoperdix nigra borneensis* (p. 3). By Charles Chubb, *Chamæpetes fagani* (p. 4), W. Ecuador; *Penelope brooki* (p. 5) Bæza, Ecuador; *Columba ogilviegranti* (p. 5), Peru. By Dr. Hartert, *Sylvia deserticola maroccana* (p. 6), W. Morocco; *Ardea cinerea firsas* (p. 6), Madagascar; *Æthopyga seheriæ tonkinensis* (p. 7), Tonkin. By E. C. Stuart Baker, nine forms from India and Siam.

British Birds. XI, No. 4. September, 1917.

Notes on Zonal Distribution in the Mountains of Latium, Italy. By C. J. Alexander.—Five zones are recognized; Mediterranean, Submountain (Chestnut), Mountain (Beech), Subalpine and Alpine. The paper is an important contribution to the zoögeography of Europe.

The Moults and Sequence of Plumages of the British Waders. By Annie C. Jackson. Part II.—Continued in October.

British Birds. XI, No. 5. October, 1917.

Observations on Birds Singing in their Winter Quarters and on Migration. By C. J. Alexander.

British Birds, XI, No. 6, November, 1917.

On Newly Discovered Irish Colonies of Roseate and Sandwich Terns. By C. J. Carrol.

John Hunt. By H. S. Gladstone. A biography.

Avicultural Magazine. VIII, No. 12. October, 1917.

A Visit to the Zoo Eighty Years Ago. By Dr. E. Hopkinson.

The Secretary Bird and Mantell's Apteryx. By Graham Renshaw.—Interesting accounts of these birds in the London Zoo.

The Great Bird of Paradise on the Island of Little Tobago. By Sir Wm. Ingram.—Diary of the caretaker who is looking after the birds which were introduced some eight years ago and which are now reported to have greatly increased.

Avicultural Magazine. IX, No. 1. November, 1917.

Birds in Macedonia. By Capt. B. E. Potter.

The Emu. XVII, Part 2. October, 1917.

The Yellow-breasted Bush-Chat (*Ephthianura crocea*). By A. J. Campbell.—With colored plate.

Ornithologists in North Queensland. By Capt. W. Macgillivray.—Account of an exploration of the open forests on the Claudie River, 1913.

Observations on the Genus *Hylacola* (Ground Wrens). By F. E. Howe. Australian Ibises. By W. H. D. LeSouef.

The Nestlings of Australian Finches: What do we Know about Them? By G. M. Mathews.

Revue Française d'Ornithologie. IX, No. 100–101. August–September, 1917. [In French.]

Anomalies and Individual Variations in Birds. By E. Anfrie.—Continued in October.

Contribution to a Study of the Changing Habitats of Shore Birds. By M. R. Deschiens.—Continued in October.

Ardea. VI, No. 2. August, 1917. [In Dutch.]

Leguatia gigantea. By A. C. Oudemans.—An extended account of this extinct species.

Messenger Ornithologique. VII, No. 2. [In Russian.]

On the Birds of the Far East. By S. A. Buturlin.—Continued.

Preliminary List of Birds Observed in the Sochi District of the Black Sea Province. By A. Koudashev.

Alauda arvensis kiborti subsp. nov. By I. M. Zaliesski (p. 125).

Ornithological Articles in Other Journals.

Macnamara, C. The Purple Martin. (Ottawa Naturalist, August-September, 1917.)—A detailed study of a colony, at Arnprior, Ont.

Millais, J. G. Brent Geese in Scotland. (Scottish Naturalist, September, 1917.)

Clarke, W. Eagle. Wild Life in a West Highland Deer Forest. (*Ibid.*, November, 1917.)

Beck, Rollo H. Bird Photographing on the Falkland Islands. (American Museum Journal, November, 1917.)—A wonderful series of pictures of Penguins, Gulls, Cormorants, Albatrosses and Sheath-bills taken by Mr. Beck, while collecting sea birds for the Brewster-Sanford Collection at the American Museum of Natural History.

Crandall, Lee S. Our Emu Family. (Zool. Soc. Bulletin, September, 1917.)—Account of the Emu in the New York Zoo.

Crandall, Lee S. The Australian Bird Collection. (*Ibid.*)

Burge, W. E. Comparison of the Catalase Content of the Breast Muscle of Wild Pigeons and of Bantam Chickens. (Science, November 2, 1917.)—Energy for muscular work is generally conceded to be derived from oxidation of food materials. Catalase is an enzyme which liberates oxygen from hydrogen peroxide. The investigation here described showed that the breast muscles of the pigeons which were accustomed to extensive flight liberated far more oxygen than did those of the Bantams which were unaccustomed to flight, while in Pigeons kept in confinement the amount of catalase decreased. This would indicate that catalase "may play a rôle in the oxidative processes of the body." As is frequently the case with those not interested in systematic zoology Mr. Burge gives one no idea what his "wild pigeons" may have been. They were certainly not the bird popularly known by that name.

McMahon, Walt F. The Protection of America's Bird Life. (Forest and Stream, November, 1917.)

Oberholser, H. C. Diagnosis of a New Pycnonotine Family of Passeriformes. (Jour. of the Washington Academy of Sciences, VII, No. 17.)—

Irenidæ, fam. nov. *Glaucomorpha* (p. 53) gen. nov. for *Irena cyanea*; *G. c. megacyanea* (p. 540) subsp. nov. from Pulo Tuanku, Banjak Islands.

Curtis, W. P. The coloration Problem II [*Picus* et al.]. (Entom. Rec. & Jour. Variation July, 1917.)

Cookman, Alfred. The Sharp-shinned Hawk of the San Gabriel Mountains [Cal.]. (Lorquinia, II.)

Hartert, Ernst and Goodson, Arthur. Notes and Descriptions of South American Birds. (Novit. Zool., XXIV, pp. 410-419.) Sixteen new forms of *Cotingidæ*, *Tyrannidæ* and *Dendrocolaptidæ*.

Hartert, Ernst. *Scolopax rusticola*. (*Ibid.*, p. 437.) — Figured.

Hartert, Ernst. On the Forms of *Coturnix coturnix*. (*Ibid.* pp. 420-425.) — Three new forms among the eight recognized: *C. c. inoperata* (p. 422), Cape Verde; *C. c. confisa* (p. 423), Madeira; and *C. c. conturbans* (p. 423), Azores.

Dickinson, Mrs. W. G. Notes of an Amateur in Ceylon. (Bird Notes, September, 1917.)

Selous, Edmund. Sexual Selection in Birds. Breeding Habits of the Ruff. (Wild Life, August, 1917.)

FitzSimons, F. W. Our Native Birds: Their Value to Man. (The South African Journal of Science, 1916, pp. 366-372.)

King, James. Bird Life in the Midlands of Natal. (*Ibid.* pp. 362-365.)

Roberts, Austin. Ornithological Notes. (Annals of the Transvaal Museum, V, pp. 246-262.) — The following new forms are described: *Spinus symonsi* (p. 257) Basutoland—first described in a separate slip supplementary to Vol. V, No. 3, January 1916. *Mirafrā africanoides harei* (p. 258), Windhuk, Demereland; *Phyllastrephus terrestris rhodesiæ* (p. 258), Machile River, N. W. Rhodesia; *Andropadus importunus noomei* (p. 259), Hænertsburg, N. E. Transvaal.

Roberts, Austin. Descriptions of a New Species and Genus of Flycatchers from East Africa, and two New Subspecies of Guinea Fowls from South Africa. (*Ibid.* VI, pp. 1-3.)—*Chloropetella* (p. 1); *C. suahelica* (p. 1), Myiai, German East Africa; *Numida papillosa damarensis* (p. 2), Windhuk, S. W. African Protectorate; *Guttera edouardi symonsi* (p. 3), Karkloof, Natal.

Mazza, F. On the Capture of two birds unusual in the Provence of Rome in 1916. (Boll. Soc. Zool. Ital. XII, pp. 191-197.) [In Italian.]

Jungersen, Hector F. E. Two Cases of *Pseudohermaphroditism* in Male Pigeons (*Columba domestica*) (Videnskabelige Meddelel. Kjtbenham, LXVIII, pp. 7-22). [In English.]

Publications Received.—**Anderson**, R. M. Recent Explorations on the Canadian Arctic Coast. (Geographical Review, IV, No. 4, pp. 241-266, October, 1917.)

Beebe, William, Hartley, G. Inness, and Howes, Paul G. Tropical Wild Life in British Guiana. Vol. I. N. Y. Zoölogical Society, 1917, 8vo, pp. 1-504, numerous illustrations. Price, \$3.00.

Bergtold, W. H. The Birds of Denver. An Annotated List. (Wilson Bull., No. 100, pp. 113-129, September, 1917.)

Cary, Merritt. Life Zone Investigations in Wyoming. North American Fauna, No. 42, pp. 1-95, U. S. Dept. Agr., October 3, 1917.

Childs, John Lewis. Catalogue of the American Natural History Library of John Lewis Childs. Small 4to, pp. 1-150, 1917.

Herrick, Francis H. Audubon the Naturalist. A History of his Life and Time. Two volumes, 8vo, pp. 1-451 and 1-494. D. Appleton & Company, 1917. Price, \$7.50.

Howser, W. D. Preliminary List of the Birds of Tennessee. Bull. No. 2, pp. 1-28. Dept. of Game and Fish, Nashville, Tenn., 1917.

Lawyer, G. A., Bancroft, W. F., Earnshaw, F. L. Game Laws for 1917. Farmers' Bulletin 910, U. S. Dept. Agr., October, 1917, pp. 1-70.

Lewis, J. C. Some Considerations on Sight in Birds. (Smithsonian Rept. for 1916, pp. 337-345, reprinted from 'The Emu,' 1916.)

Mathews, Gregory M. The Birds of Australia. Vol. VI, Part V, pp. 373-444, September 11, 1917.

Meriden Bird Club. Third Report, pp. 1-107, 1916.

Oberholser, Harry C. (1) A Review of the Subspecies of the Leach Petrel, *Oceanodroma leucorhoa* (Vieillot). (Proc. U. S. Nat. Mus., Vol. 54, pp. 165-172, October 19, 1917.) (2) Birds Collected by Dr. W. L. Abbott on Various Islands in the Java Sea. (*Ibid.*, pp. 177-200, November 2, 1917.) (3) Birds of the Anamba Islands. Bull. 98 U. S. Nat. Mus., pp. 1-75, June 30, 1917. [Not received until December 6.]

Paxson, H. D. The Last of the Wild Pigeon in Bucks County (Penna.). pp. 1-18. Privately printed, October, 1917.

Pearson, T. Gilbert, and others. Birds of America. Vols. I-III, 4to, pp. 1-272, 1-271 and 1-289, numerous colored plates and text figures. issued as part of the Nature Lovers' Library, University Society Inc. New York. Price for whole series of Library, six volumes, \$28.

Peters, Jas. L. Birds from the Northern Coast of the Dominican Republic. (Bull. Mus. Comp. Zoöl., Vol. LXI, No. II, pp. 391-426, October, 1917.)

Sclater, W. L. On a New South American Jay of the Genus *Cyanolyca*. (Ibis, October, 1917, pp. 465-466.)

Strong, R. M. Some Observations on the Origin of Melanin Pigment in Feather Germs from the Plymouth Rock and Brown Leghorn Fowls. (Anatom. Record, Vol. 13, No. 2, pp. 97-108, July, 1917.)

Swarth, H. S. and Bryant, H. C. A Study of the Races of the White-fronted Goose (*Anser albifrons*) Occurring in California. Univ. of Cal. Publ. in Zool., Vol. 17, No. 11, pp. 209-222, October 19, 1917.

American Museum Journal, The, XVII, No. 7, November, 1917.

Avicultural Magazine, (3), VIII, Nos. 11 and 12, IX, No. 1, September-November, 1917.

Ardea, VI, No. 2, August, 1917.

Bird-Lore, XIX, Nos. 5 and 6, September-December, 1917.

Bird Notes and News, VII, No. 7, Autumn, 1917.

British Birds, XI, Nos. 4, 5 and 6, September-November, 1917.

Bulletin, British Ornithologists' Club, No. CCXXVII, October 30, 1917.

- Bulletin** Charleston Museum, XIII, No. 6, October, 1917.
Bulletin State Normal School, Cheney, Wash., B. No. 1, September, 1917.
California Fish and Game, III, No. 4, October, 1917.
Carthage College Bulletin, III, No. 11, April, 1917.
Condor, The, XIX, No. 5, September–October, 1917.
Current Items of Interest, No. 34, October, 1917.
Emu, The, XVII, Part II, October, 1917.
Fins, Feathers and Fur, No. 11, September, 1917.
Forest and Stream, LXXXVII, Nos. 10–11, and 11, October and November, 1917.
Glasgow, Naturalist, The, IV and V, 1912 and 1913.
Ibis, The, (10), V, No. 4, October, 1917.
Journal Cincinnati Soc. Nat. Hist., XXII, No. 2, November, 1917.
Messenger Ornithologique, XI, No. 2, 1917.
New Jersey Audubon Bulletin, No. 22, November, 1917.
Oölogist, The, XXXIV, Nos. 9, 10, and 11, September–November, 1917.
Ottawa Naturalist, The, XXXI, No. 5–6, August–September, 1917.
Philippine Journal of Science, The, XII, Sect. D., Nos. 1, 2, and 3, January, March and May, 1917.
Proceedings Academy Nat. Sci. Phila., LXIX, Part II, April–September, 1917.
Records of the Australian Museum, XI, No. 11, October, 1917.
Revue Française d'Ornithologie, Nos. 100–101, and 102, August–October, 1917.
Science, N. S., LXVI, Nos. 1186–1198.
Scottish Naturalist, The, Nos. 69, 70 and 71, September–November, 1917.
Wilson Bulletin, The, XXIX, No. 3, September, 1917.
Zoological Society Bulletin, XX, No. 5, September, 1917.

CORRESPONDENCE.

EDITOR OF 'THE AUK':

In the notice of Lloyd-Jones's paper on feather pigments in the last April number of 'The Auk' (Vol. XXXIV, p. 232) there is one statement which might be misleading, and I should accordingly like to put on record a somewhat fuller statement of the point in question. Speaking of the so-called blue color of domestic-pigeons the review states that "blue as in all birds is a structural color." It is true spectral blue in all birds is a structural color, for as Lloyd-Jones says: "No blue pigment substance has ever been discovered in the integument of higher vertebrates." The point is, to quote further: "The color called 'blue' in domestic pigeons has very little claim to that name. It is not at all comparable to the blue of the bluebird, jay or indigo bird, but resembles more the so-called blue of the rabbit or maltese of the cat. In other words, the color belongs more properly among the grays than among the blues. The 'gull-gray' of Ridgway ('12, plate 53) is a fair representation of the blue of the domesticated pigeon. Typical spectrum blue, however, is found among tropical members of the pigeon family," and there it is doubtless due to structural causes. The 'blue' of the domestic pigeon is then merely a neutral tint such as might be produced by a layer of soot on snow, or by any intimate mixture of black and white. In the pigeon "the blue effect is produced by a layer of pigment-free material intervening between the eye [of the observer] and the pigment mass" in the barbule cell of the feather.

Sincerely,

LEON J. COLE.

University of Wisconsin, Nov. 1, 1917.

NOTES AND NEWS

LYMAN BELDING, a Retired Fellow of the American Ornithologists' Union died at Stockton, Calif., Nov. 22, 1917. He was born at West Farms (Northampton), Mass., June 12, 1829, and at the time of his death was nearly eighty-eight and a half years old. He was the oldest member of the Union and the oldest American ornithologist.

Mr. Belding became interested in birds about 1876 and during the next 20 years was prominently identified with field work in California and Lower California. In 1879 he published 'A Partial List of the Birds of Central California' containing notes on 220 species. Two years later he made a trip to Cerros Island and San Quentin Bay, L. C. In the winters of 1881-82 and 1882-83 he made two trips to the Cape region of Lower California where he collected the types of several new birds and added much to our knowledge of the avifauna of the region. The results of these trips appeared in several papers in 1883 in the Proceedings of the U. S. National Museum. Upon the organization of the American Ornithologists' Union he was selected by the Committee on Bird Migration to take charge of the migration work in the Pacific District. For two or three years he carried on this work actively and the results were published in 1890 in his well known 'Land Birds of the Pacific District'. A corresponding volume on the 'Water Birds of the Pacific District' was prepared but never published and the manuscript is now deposited in the Bancroft Library of the University of California.

Mr. Belding's field work in California was done mainly in the vicinity of San Diego, Gridley, Marysville, Stockton, and in the Sierras in Calaveras and Placer counties. Among the birds which bear his name are Belding's Jay (*Aphelocoma californica obscura*), *Geothlypis beldingi*, *Oceanodroma beldingi*, *Passerculus beldingi* and *Rallus beldingi*. He was elected an Active Member of the American Ornithologists' Union at the first meeting in 1883 and he was placed on the list of Retired Fellows in 1911. In 1896 he was made an Honorary Member of the Cooper Ornithological Club. His portrait was published in 'The Condor' in 1900 (vol. II, p. 2).

In accordance with the custom of recent years an address on his life and work will be presented at the next meeting of the Union. The President of the Union has appointed Dr. A. K. Fisher to prepare this memorial.—T. S. P.

DR. HENRY MCHATTON, of Macon, Ga., an Associate of the American Ornithologists' Union since 1898, died of pneumonia on April 22, 1917, shortly after returning from Florida where he had spent the winter. Dr. McHatton was born at Baton Rouge, La., on the 29th of February, 1856. His parental home was a large sugar plantation on the Mississippi River just south of Baton Rouge, but on account of conditions brought about by the Civil War the family was forced to leave this home when he was seven years old. From Louisiana they traveled by wagon through Texas to the Mexican border, several months being occupied in making the trip. From northern Mexico Dr. McHatton's father went to Cuba, where he again took up his business of sugar growing. After the ten years' war in Cuba and the death of his father, Dr. McHatton returned to the United States, going to New York City, where he studied medicine and graduated from the old Bellevue College of Medicine in 1881. On account of his health he moved in 1883 to Macon, Ga., where he took up the practice of his profession.

Through the varied experiences of his youth the love of out doors was intensified as years went by. He was always interested in anything pertaining to ornithology and a personal knowledge of the habits of birds, animals and fish was a source of constant pleasure to him. He was an officer of the original Audubon Society of Georgia which was reorganized a few years ago. In his death the game and fish of Georgia lost a great friend.—T. H. McHatton.

ORNITHOLOGICAL WORK IN 1917.¹—At the recent meeting of the Union an hour was devoted to a consideration of 'Ornithological Work in 1917' for the purpose of reviewing briefly the activities of the year. While war conditions have necessarily curtailed activity in various directions and especially in field work, the review showed that much had been accomplished although most of the published work was necessarily based on investigations made in previous years.

Field Work. Of chief interest is the work accomplished by several of the museums through expeditions and special collectors.

The Museum of Vertebrate Zoölogy of Berkeley, Calif., devoted its attention chiefly to the southwest. H. S. Swarth visited southern Arizona and obtained material for a report on the birds found on the Apache Trail, while Grinnell and Dixon spent some time in the Death Valley region in California. In the north W. E. C. Todd was in the field five months in charge of the Carnegie Museum Expedition to northern Quebec. In tropical America the activity of previous years has decreased with the return of the American Museum Expeditions from South America but one party, comprising Messrs. Miller, Griscom and Richardson, spent four months collecting

¹ The following summary is based on a discussion of the subject in which A. A. Allen, Frank M. Chapman, H. K. Job, H. C. Oberholser, T. Gilbert Pearson and the Secretary took part. Extended titles and references to papers are omitted as most of the publications here mentioned are reviewed in the volumes of 'The Auk' for 1917 or 1918.

for the Museum in Nicaragua. In the West Indies, Haiti and San Domingo have been the center of attraction. W. L. Abbott, Rollo H. Beck, and Paul Bartsch visited the island at different times and each secured some remarkable birds or made substantial additions to our knowledge of the local avifauna. In South America Beebe spent some time at the tropical laboratory near Georgetown, British Guiana, and Beck returned from southern Patagonia with rich collections of sea birds. From the Orient the American Museum Expedition to China, Yunnan, and northern India in charge of Roy C. Andrews returned after successfully completing its field work, and from Celebes, H. C. Raven sent some valuable collections of birds to the U. S. National Museum.

In the United States the work of the Biological Survey has been carried on with the usual activity in a number of States. In the south A. H. Howell continued his field studies of the birds of Alabama and Francis Harper visited the Okefinokee Swamp in Georgia and the everglade region in Florida. In the west H. H. T. Jackson began work on a biological survey of Wisconsin and H. C. Oberholser investigated the breeding ground of waterfowl in North Dakota. In Montana E. A. Preble collected in the southeastern part of the state south of the Northern Pacific Railroad, and Mr. & Mrs. Vernon Bailey spent some weeks studying the birds of the Glacier National Park and collected material for a report to be issued in coöperation with the National Park Service. In the Northwest preliminary work on a biological survey of Washington was begun by W. P. Taylor and in the southwest E. A. Goldman collected in northern Arizona south of the Grand Canyon.

Economic Ornithology. Studies of the food of birds, especially ducks, and of methods of attracting birds have been continued by W. L. McAtee, a new study of the crow has been made by E. R. Kalmbach and the European Starling has been the subject of an investigation by Kalmbach and Gabrielson. A report on the game birds of California by Grinnell, Bryant and Storer has been completed and is now in press. In the field of experimentation much work has been done by H. K. Job at Amston, Conn., at the Bird Experiment Station of the National Association of Audubon Societies.

Literature. The publications of the year, while perhaps fewer in number than those for some years immediately preceding the war, include a number of important titles. Among general works should be mentioned the annual volume of the 'Zoölogical Record' for 1915 containing 934 titles on birds, Ridgway's 'Birds of North and Middle America,' Vol. VIII, devoted to Shorebirds, Gulls and Terns (the manuscript has been completed but not printed), Mathews' great work on the 'Birds of Australia' of which five parts of Vol. VI have recently appeared, the seventh edition of Mrs. Bailey's 'Handbook of the Birds of the Western United States,' and a popular work in three volumes on the 'Birds of America,' edited by T. Gilbert Pearson and published in the Nature Lovers' Library. Of the many faunal publications, Chapman's comprehensive volume on the 'Dis-

tribution of Bird Life in Colombia' is probably the most important, while Beebe's 'Tropical Wild Life in British Guiana,' and W. S. Brooks' Notes on 'Falkland Island Birds,' based on the work of the Phillips Expedition of 1915-16, furnish glimpses of the avifauna of the extremes of the South American continent. Two important reports on insular bird life off the North American coast are Howell's 'Birds of the Islands off the Coast of Southern California' and Hanna's paper on the 'Birds of St. Matthew Island' in Bering Sea. Among the numerous papers on the birds of the Eastern Hemisphere, Despott's 'Notes on the Ornithology of Malta', Captain Sladen's 'Notes on Birds observed in Macedonia', Selater's 'Birds of Yemen, southwest Arabia', Oberholser's 'Birds of Bawean Island, Java Sea', and 'Birds of the Anamba Islands in the China Sea'. H. L. White's account of North Australian Birds' and J. P. Chapin's 'Classification of Weaver Birds' merit special mention. The more technical papers comprise Richmond's third supplement to Waterhouse's 'Index Generum Avium', containing 600 'Generic Names applied to Birds during the years 1906 to 1915 inclusive', Oberholser's series of 'Notes on North American Birds', and Wayne's 'List of Species for which South Carolina is the type locality'. Bergtold's extended 'Study of the Incubation Periods of Birds' and Casey A. Wood's 'Fundus Oculi of Birds' are notable contributions to little cultivated fields of ornithological literature. Avian anatomy has received some attention in Wetmore's 'Secondary Characters in the Ruddy Duck' and Petronievic and Woodward's paper 'On the Pectoral and Pelvic Arches of the British Museum Specimen of *Archæopteryx*' (P. Z. S. pp. 1-6). New light has been thrown on some of the extinct birds of the United States by Matthew and Granger's description of 'The Skeleton of *Diatryma*' from the Eocene of Wyoming, and Shufeldt's accounts of Fossil Birds from Vero, Florida. In the department of biography the record of the year is rather remarkable. Here should be mentioned J. A. Allen's notable 'Autobiography' (printed in 1916 but not generally distributed until early in the present year) Herrick's 'Audubon the Naturalist', in two volumes, and the final parts of Mullens and Swann's 'Bibliography of British Ornithology'.

Educational Work. A notable feature of ornithological work of the twentieth century is the ever increasing attention given to bird study in the schools and colleges. As an aid to beginners in this subject Pearson has prepared a useful and instructive 'Bird Study Book'. Foremost in the educational field is the National Association of Audubon Societies which during the year has organized 11935 Junior Audubon Classes in which instruction on birds has been given to 261,654 children in the United States and Canada. The Association has also arranged for courses in bird study in 11 Summer Schools including the Maryland Agricultural College, University of Virginia, Summer School of the South at Knoxville, Tenn., the State Universities of Colorado, Florida, Georgia, Mississippi, South Carolina and Vermont and several other institutions. A course in ornithology was given this year at the summer Biological Station of the

University of Michigan. Cornell University, which for several years has given credit for ornithology in undergraduate work, now includes bird work in graduate courses leading to the degree of M. S. and Ph.D., has established a course of instruction in game breeding, and at the recent session of the legislature secured an appropriation of \$15,000 for a game farm to be administered along educational and experimental lines.

Legislation. Among the 250 or more game laws enacted in the United States in 1917 by the various state legislatures are many that affect birds. A strong tendency has been manifested to suspend the shooting of certain game birds for several years. The Sage Grouse has been protected at all seasons in about half of its present range and similar protection has been given Prairie Chickens in Idaho, Iowa, and Oklahoma; Quail in Idaho, Iowa, Nebraska and Ohio; Woodcock in eight states in the Mississippi Valley; and all shore birds except Jacksnipe in California. Stringent plumage laws in Oklahoma now forbid the sale of aigrettes and in California prohibit traffic in aigrettes, Birds of Paradise, Goura Pigeons and Numidi. A general effort has been made to bring the state laws into conformity with the Federal migratory bird regulations and in twenty-one states the open seasons on waterfowl are now practically uniform with the Federal seasons. This has resulted in general prohibition of spring shooting. A law to carry into effect the provisions of the treaty protecting migratory birds, ratified last year, has been passed by Canada and a similar enabling act to carry the treaty into effect in the United States has passed the Senate and is now awaiting action by the House of Representatives at the present session of Congress.—T. S. P.

THE LIST OF FELLOWS OF THE A. O. U.—The election of Percy A. Taverner to fill the only vacancy in the list of Fellows at the recent meeting of the Union recalls the fact that although the number of Fellows has always been restricted to fifty, the limit has been reached on only two previous occasions and in each case a full list was maintained little more than a year. The list was first filled at the 7th Congress in 1889 by the election of Dr. A. P. Chadbourne, and sixteen months later, on March 10, 1891, a vacancy occurred through the death of Col. N. S. Goss. Twenty-three years later the limit was again reached in 1914, but the death of Dr. D. G. Elliot on Dec. 22, 1915, caused a vacancy and three others occurred before the next meeting in 1916.

The total number of Active Members or Fellows elected during the thirty-four years of the existence of the Union is apparently eighty-three. In addition to the fifty names now on the list of Fellows, are seventeen on the Deceased list, four placed on the Retired list (two now deceased), five transferred to the Corresponding list (four now deceased), and seven names of persons who either failed to qualify or retained their membership only a few years. Those transferred to the Corresponding list include: Montague Chamberlain, a Founder, 1901; Dr. D. Webster Prentiss, deceased, a Founder, transferred in 1895; Dr. J. G. Cooper, deceased, elected in 1883

and transferred in 1884; Capt. T. W. Blakiston, deceased, elected to the Active list in 1884 (Auk, 1884, p. 370) but always included among the Corresponding Members; and Walter E. Bryant, elected in 1888 and transferred in 1900, five years before his death. Prof. F. H. King, elected in 1883, apparently did not qualify, nor did Prof. F. E. L. Beal who was elected again in 1901, and six others retained active membership only a few years: H. B. Bailey, a Founder, until 1891; Prof. S. A. Forbes, 1883-1892; L. S. Foster, 1888-1902; Dr. Henry Kidder, 1883-1888; Dr. F. W. Langdon, 1887-1897; and W. E. D. Scott, 1886-1895.

Twelve of the twenty-three Founders are still living and ten are enrolled in the list of Fellows.—T. S. P.

CALLED TO THE COLORS.—At the recent meeting of the American Ornithologists' Union the Secretary was instructed to prepare a list of the members who have entered military service either with the army or navy. This instruction has been construed broadly to include not merely those who have been drafted but also those who are serving in officers' training camps, in hospitals, with the Red Cross, or in Y. M. C. A. military work. Such a list is necessarily incomplete and subject to constant change but will be of permanent interest in showing the part taken by members in the war.

ANTHONY, H. E., New York City. Officers Training Camp, Plattsburg, N. Y.

BEEBE, C. WILLIAM, New York City. American Flying Corps.

BOYLE, HOWARTH S., New York City. In France.

BROOKS, ALLAN, Okanagan Landing, B. C. Major Second Army School of Scouting etc., British Expeditionary Forces in France.

BROOKS, W. SPRAGUE, Boston, Mass. In the Navy.

BURLEIGH, THOMAS D., Pittsburg, Pa. Y. M. C. A. Army & Navy Association, in France.

CHAPIN, JAMES P., New York City. Officers Training Camp, Plattsburg, N. Y.

DUGMORE, A. RADCLIFFE, New York City. Captain, King's Own Yorkshire Light Infantry, now in the United States.

GRISCOM, LUDLOW, New York City. Officers Training Camp, Plattsburg, N. Y.

HARPER, FRANCIS, Washington, D. C. Corporal Co. C, 312th Machine Gun Battalion, Camp Meade, Md.

HOLT, ERNEST G., Washington, D. C. Corporal Co. C, 312th Machine Gun Battalion, Camp Meade, Md.

KITTREDGE, JOSEPH, JR., Missoula, Mont. First Lieut., 10th Engineers (Forest), in France.

MAYFIELD, DR. GEORGE R., Nashville, Tenn. In France.

MEYER, MISS HELOISE, Lenox, Mass. Red Cross, in France.

PEPPER, DR. WILLIAM, Major, Medical Reserve Corps, Ft. Oglethorpe, Ga.

- PETERS, JAMES LEE, Harvard, Mass. 2d Lieut. Quartermaster's Corps, Camp Devens, Ayer, Mass.
PHILLIPS, DR. JOHN C., Wenham, Mass. Medical Corps, Fort Benjamin Harrison, Indianapolis, Ind.
SANBORN, COLIN CAMPBELL, Evanston, Ill. Battery C, 149th U. S. Artillery, Fort Sheridan, Ill.
STEINSON, DR. ARTHUR M., Washington, D. C. Medical Corps of the Navy, Newport, R. I.
STORER, TRACY IRWIN, Berkeley, Calif. Base Hospital, Camp Lewis, American Lake, Wash.
YOUNG, JOHN P., Youngstown, O. Captain Co. —, Camp Dix, Wrightstown, N. J.

In addition to the above list mention should be made of Dr. and Mrs. Frank M. Chapman who have taken up their residence temporarily in Washington, D. C., and are devoting their entire time to work with the Red Cross, Dr. Chapman (F) being in charge of the Red Cross bureau of publications.

Relatives or friends who may have additional information concerning these or other members are requested to communicate with the Secretary giving any facts as to rank, branch of the service or present location of members in military service in order that necessary corrections in the list may be made from time to time.

T. S. Palmer,
Secretary.

1939 Biltmore St., N. W.
Washington, D. C.

Just as we go to press we have received Dr. Frank M. Chapman's work on 'The Distribution of Bird Life in Colombia', forming Volume XXXVI of the 'Bulletin of the American Museum of Natural History' and embodying the results of the various expeditions sent out to Colombia by the museum during the years 1910-1915. This work which is one of the most important contributions ever made to neotropical ornithology will be reviewed at length in the April issue of 'The Auk'.

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TAIL-FEATHERS AND THEIR MAJOR UPPER COVERTS.

BY HUBERT LYMAN CLARK.

RECENTLY when examining the pterylosis of a trogon, I noticed that the middle pair of tail-feathers lacked major coverts. This led me to look at several other alcoholic birds and I found that the number and position of the major upper coverts bore a constant relation to the tail feathers. On consulting the literature of the subject, I was surprised to find that the fact had never been recorded, if it had ever been observed. Indeed it is notable how very commonly the tail has been ignored in general works on birds. For example in Beddard's 'Structure and Classification of Birds,' there are sections on bill, feet, wing, etc. but not a line on the tail and in the well-known 'Dictionary of Birds,' there is no article on either "tail" or "coverts"; the article on "rectrices" does not refer to the coverts and the article on "tectrices" assures us that while the wing coverts are of great importance, "the tail coverts need little further attention!" In Coues' famous 'Key to North American Birds,' there is an excellent section on the tail, with an interesting paragraph on the coverts, but the number and position of the major coverts are not mentioned. Even Nitzsch gives no information in regard to the tail coverts and their relation to the rectrices.

In view of this rather surprising gap in our knowledge, it seemed to me worth while to see what data I could acquire in the small amount of time I could give to the subject. It became clear at

once that little could be learned from skins, at least without seriously damaging them. This is no doubt one of the main reasons why our knowledge is so incomplete. Fortunately the Museum of Comparative Zoölogy has a very large and varied collection of alcoholic birds, which thanks to the kindness of the Director, Mr. Samuel Henshaw, and the Associate Curator of Birds, Mr. Outram Bangs, is freely accessible to me. I have thus been able to examine the tails and major coverts of more than a hundred genera of birds, representing most of the larger and more important orders. The results of this hasty and superficial work are given here and are, I believe, of considerable interest and perhaps of some importance.

The major upper coverts of a bird lie in a single series directly above the rectrices. In the vast majority of birds, they are quite distinct from the other coverts, which rise from the posterior part of the spinal pteryla, and are so definitely circumscribed that their number permits of no discussion. In some birds however, notably the loon and the penguin, it is exceedingly difficult to distinguish any particular series of coverts as "major" and one can simply assume that the series next above the rectrices should receive that title. But in such cases, it is hard to determine where the outer end of this series, on each side, is and there is room for considerable difference of opinion. I have seen no case however where I was unable to satisfy myself as to the number of major coverts. In some birds, notably the woodpeckers, a series of contour feathers on the sides of the pygidium is continuous with the series of major coverts, and in such cases there is again some trouble in definitely limiting the covert series.

The relative position of covert and rectrix shows some diversity. As a rule each covert is inserted at the base of its own rectrix and the line of covert-pits (on a plucked bird) is parallel to the series of rectrix-pits. But sometimes the two series are not parallel, the outer covert-pits being distinctly further from the rectrices at the corners of the pygidium than near the middle. As a rule, the middle pair of tail-feathers is the largest and they are inserted at a higher level than the others; as a result their coverts are pushed to the outer side. Thus covert 1 does not lie above rectrix 1 but between the bases of 1 and 2 or over rectrix 2, and in some cases, where the middle rectrices are particularly stout as in the Pileated

Woodpecker, covert 1 lies between the bases of rectrices 2 and 3. On the other hand in young birds and sometimes in adults, covert 1 is directly over rectrix 1 and each succeeding covert overlies its own rectrix.

The relative size of the different major coverts is also a matter which shows some diversity, though as a rule covert 1 is largest and the size decreases quite uniformly to the outermost member of the series, which is the smallest. Not infrequently however, at least among water-birds, covert 1 is distinctly smaller than 2, and occasionally, as in the bittern, it is very small. Sometimes the third or fourth covert may be the largest, the second and first about equalling the fifth and sixth. The most extreme case is that of the cormorants, where the three outer coverts are large and well-developed with 6 the largest, 5 smaller and 4 still smaller, while the three inner coverts are much reduced and 1 is the smallest of all.

According to the relative number of coverts and rectrices, birds divide naturally into three groups: (1) coverts and rectrices of the same number; (2) coverts more numerous than rectrices; (3) coverts less numerous than rectrices.

In all normal individuals, the tail-feathers of a bird are arranged in pairs, an equal number on each side of the mid-line of the pygidium. In the following tables therefore the condition on only one side is referred to. The rectrices are numbered from the middle outwards, no. 1 being next to the mid-line. The major coverts are numbered correspondingly. The formula "6-6" indicates that there are six rectrices and six major coverts on each side of the pygidium; "6-4" shows six rectrices but only four coverts while "8-6" shows eight rectrices and six coverts. The number of rectrices is invariably placed first.

It should be clearly understood, and I cannot emphasize the point too strongly, that the statements made here in regard to number and position or size of the coverts and rectrices are based wholly upon my own recent and hasty observations. They are thus liable to correction, particularly with reference to the larger groups. When I say for example that the Passeres have six rectrices and only five coverts, I am not ignorant of the fact that some Passeres have seven rectrices. I merely know nothing about the number and position of the major coverts in such cases, so, for the purpose

of this paper, I ignore them. This statement of my observations is purely introductory and is not intended to be as dogmatic as it sometimes appears.

I. COVERTS AND RECTRICES OF THE SAME NUMBER.

- 4-4. *Crotophaga*.
- 5-5. Trochili. Cyseli. Caprimulgi. Cuckoos. Toucan (*Selenidera*). *Jaçana*. *Botaurus*.
- 6-6. Pici. Columbæ. Most Accipitrës. Curassows. Nearly all waders and shore-birds. Cranes. Most terns and small gulls. Cormorants. Gannets. Man-of-war-birds. Petrels.
- 7-7. *Zenaidura*. Gannets.
- 8-8. A single individual of *Lagopus*.
- 9-9. *Tetrao*.
- 10-10. Pelicans. Loons. Penguin.

II. COVERTS MORE NUMEROUS THAN RECTRICES.

Except in some owls and the remarkable case of the toucan given below, the additional coverts are at the base of, or beyond, the outermost rectrix on the side of the pygidium. In owls having 6-7, the extra covert *seems* to be between 4 and 5 but probably this is due only to shifted positions of 5, 6 and 7.

- 5-6. A single individual of *Botaurus*, on one side only.
- 6-7. Owls. Osprey. *Cancroma*. A single individual Flamingo. Some gulls.
- 6-8. Some young owls. Some ospreys. *Anhinga*. Albatross. *Cephus*.
- 6-9. Some individuals of *Cephus* and some albatrosses.
- 7-8. Flamingo. Most ducks.
- 7-9. Some ducks.
- 8-9. Some ducks. Geese. *Fratercula*.
- 8-10. *Dafila*. *Ossifraga*.
- 9-10. Some ducks.
- 10-12. Swan.

5-8, 10 or 11. Toucan (*Ramphastos cuvieri*). This is the most extraordinary case of supernumerary coverts, I have seen. As a rule there are 10 or 11 major coverts in a single, distinct but crowded series. In one individual however I found only 8 coverts and it may be there is considerable individual diversity. Ordinarily there are two coverts over the base of rectrix 2, with none over rectrix 1; covert 3 is between rectrices 2 and 3 while covert 4 is directly over rectrix 3; covert 5 is between rectrices 3 and 4, while covert 6 is over rectrix 4; covert 7 again is between rectrices 4 and 5, and covert 8 is over rectrix 5; coverts 9-11 are on the corner of the pygidium, outside the rectrices. In the individual with only 8 coverts, the indications are that coverts 1, 10 and 11 are missing. A further study of this remarkable toucan is much to be desired.

III. COVERTS LESS NUMEROUS THAN RECTRICES.

In every case examined, the reduction in the number of coverts seems to take place at the outer end of the series, but it is possible that in the Passeres and birds with a similar arrangement, covert 1 is wanting rather than simply displaced. In those unusual cases where there are two coverts fewer than the rectrices, one of the missing coverts is possibly no. 1. The question could probably be answered by examination of large embryos or nestlings of the Guinea-fowl or European Quail.

5-4. Motmot (*Baryphthengus ruficapillus*).

6-5. Passeres. Psittaci. Kingfishers. Trogons. Some small hawks. Rails.

6-4. *Coturnix*. *Cyrtonyx*.

7-6. Coot. Gallinules.

8-7. *Lagopus*.

8-6. *Numida*.

9-8. Pheasants. *Bonasa*.

It will be seen from the above data, that relatively few birds have more coverts than rectrices and these are chiefly natatorial birds. Among land-birds, only the owls, the osprey and the big toucan have supernumerary coverts, while of water-birds there are

the Flamingo, the Anseres, the Snake-bird, the Giant Petrel, albatrosses and auks. In *most groups* of birds, the coverts are of the same number as the rectrices, as shown by the various "picarian" birds, the pigeons, the diurnal birds of prey, the curassows and a few other land birds, and the numerous waders, gulls, terns, petrels, Steganopodes, loons and penguins, among water-birds. There can be little doubt that *most species* of birds have fewer coverts than rectrices, for here we find the bulk of the land-birds, Passeres, parrots, kingfishers, trogons, motmots, most gallinaceous birds and a few small hawks; oddly enough the Fulicariæ alone among water-birds have the number of major coverts reduced.

For future reference and to aid in the further investigation of this subject, it seems desirable to put my observations on record here. I have arranged them under the orders recognized and listed by Sharpe in 1891 because no more recent classification of birds seems to me as generally satisfactory as his. I have examined none of the Ratitæ, Crypturiformes, Opisthocomiformes, Heliornithiformes, Podicipediformes, Eurylaemi or Menuræ.

GALLIFORMES. A large curassow from Brazil (species undetermined) had 6 rectrices and 6 coverts. A fine large *Tetrao* showed 9-9 and a single individual of *Lagopus* showed 8-8. All the other galliformes examined by me showed fewer coverts than tail feathers. In *Numida* the formula is 8-6 and in *Coturnix* 6-4. A single specimen of *Cyrtonyx* also showed 6-4, but the pygidium was injured, so I am not sure of this genus. The other genera¹ examined were *Canachites* (8-7), *Tympanuchus* (9-8), *Bonasa* (9-8), *Francolinus* (7-6), *Phasianus* (9-8) *Orcortyx* (6-5) and *Ortyx* (6-5).

COLUMBIFORMES. The number of major coverts corresponds to that of the rectrices. Their position is on the outer side of the base of each tail-feather at the middle of the tail but soon they lie above the rectrices. The genera examined were *Columba* (6-6), *Ectopistes* (6-6), *Zenaidura* (7-7; on one side in one individual, 7-8), *Melopelia* (6-6) and *Chaemepelia* (6-6).

RALLIFORMES. Three species of *Rallus* and one of *Porzana* show 6-5, and covert 1 is smaller than 2 and sometimes quite small;

¹ For convenience I use the generic names of the 'British Museum Catalogue.'

an unidentified king rail from Brazil showed 6-6. An unidentified coot and a gallinule, also from Brazil, showed 7-6. The position of the coverts is as usual.

COLYMBIFORMES. A loon showed 10-10, with each covert over its rectrix except 1.

SPHENISCIFORMES. A penguin (*Spheniscus*) from Chili showed 10-10, each covert over its rectrix. There is great difficulty in both the loon and the penguin in distinguishing the major from the other coverts, so densely are the feathers crowded on the pygidium.

PROCELLARIFORMES. In *Procellaria*, *Fulmarus* and *Daption* the number of coverts is the same as the number of tail-feathers, 6-6; in one petrel, I found only 5 coverts on one side. But in *Ossifraga* (8-10) and *Diomedea* (6-8 or 9) the coverts are distinctly more numerous than the rectrices. The extra coverts are beyond the outer rectrices.

ALCIFORMES. In *Uria* (= *Cepphus*) the formula is 6-8 or 9, and one of the extra coverts may be at the inner end of the series; it is apparently a supernumerary covert in the strictest sense, as it is probably not really homologous with the other major coverts; this is indicated by its small size and its position above rectrix 1 on its inner side. The coverts are seldom over their rectrices, though 1 and 2 generally are; covert 7 is over rectrix 6, but 3, 4, 5 and 6 lie between rectrices. The third or fourth covert is longest, 2 and 1 being decidedly smaller. In *Fratercula*, the formula is 8-9 and the coverts are almost or quite over their respective rectrices; 9 is outside rectrix 8. The third or fourth covert is clearly longest.

LARIFORMES. In *Sterna*, *Rynchops* and a few gulls, the formula is 6-6 but in two large unidentified gulls, it was 6-7 or 6-8; the outer coverts are small and might easily be overlooked. In most gulls covert 1 is a little smaller than 2.

CHARADRIIFORMES.—In *Jacana*, the formula is 5-5 but in *Arenaria*, *Aegialitis*, *Numenius*, *Bartramia*, *Calidris* and *Pelidna*, it is 6-6. I regret greatly I could examine none of the shore-birds having more than 12 rectrices.

GRUIFORMES. In *Grus americana*, the arrangement is 6-6 and each covert is over its own rectrix. Covert 1 is the smallest and 3 is the largest, 2, 4, 5 and 6 being intermediate.

PELARGIFORMES. In *Ibis*, we find 6-6, and the same is true of *Ardea*, *Herodias*, *Nycticorax* and *Tantalus*. *Cancroma* shows 6-7, the extra covert being above rectrix 6. Nitzsch says that he found only *ten* rectrices in *Cancroma*. I had but one specimen and it is unidentified but there are clearly *twelve* rectrices, the number accredited to *Cancroma* in the 'British Museum Catalogue.' The coverts alternate with the rectrices as a rule. In *Botaurus* the formula is 5-5 or occasionally 5-6, suggesting that the reduction in the tail of this genus is quite recent, the extra covert being a relict from the former condition of 6-6. The coverts in the bittern are above the rectrices.

PHOENICOPTERIFORMES. I was fortunate in being able to examine four flamingos. In three, the arrangement was 7-8, but in the fourth it was 6-7. The last specimen had a normal tail but with only twelve rectrices. The first covert is the longest and lies outside the first rectrix.

ANSERIFORMES. The single swan examined showed 10-12, the extra coverts outside the last rectrices and by no means clearly distinct from other contour feathers. In *Branta*, I found 8-9, and also in *Anas*. In *Spatula*, *Cosmonetta* and *Nyroca*, the formula is 7-8 or 9. In *Clangula*, we find 8-9 or 10 and in *Dafila*, 8-10. In *Erismatura*, 9-10 or 11 occur. In all Anseriformes, we find then more coverts than rectrices. In general each covert lies over its rectrix and the additional coverts are at the outer end of the series, where they are often hard to distinguish from the ordinary contour feathers. Occasionally covert 1 lies beside rather than above rectrix 1. In *Clangula*, the series of major coverts is nearer the end of the pygidium at the middle than it is on either side; in other words the covert-series is not parallel to, but divergent from, the rectrix-series.

PELICANIFORMES. In all steganopodous birds, except *Plotus*, the number of coverts corresponds to the number of rectrices; the same is true of their position as a rule. But in relative size there is more diversity. In *Phalacrocorax*, we find 6-6, with the extraordinary condition of the coverts described above (p. 115). In *Sula* we find 6-6 or 7-7, coverts and rectrices corresponding in position and size. In *Fregata*, there are 6-6, with coverts 2 and 3 the longest but 1 not much smaller. In *Phaethon*, I find 7-7 or 8-8,

with 1 the longest. In *Pelecanus*, 10-10 is the arrangement, each rectrix with its own covert above it. In *Plotus*, we find 6-8 or 9 with all the coverts small and narrow and 3 or 4 the longest.

CATHARTIDIFORMES. In a half grown King Vulture (*Sarcophamphus*) there are six pairs of large rectrices each overlaid very regularly by a major covert. The same is true in the Turkey Buzzard (*Cathartes*) but here covert 1 is smaller than 2 or 3.

ACCIPITRIFORMES. In *Circus*, *Astur* and *Haliaetus*, we find 6-6 and in the eagle, the first is somewhat smaller than the second. In *Falco albicularis* and *Cerchneis sparveria*, the arrangement is distinctly 6-5 as in Passerine birds. In *Pandion*, on the other hand, we find 6-7 or 8 as in owls; the first covert is a trifle smaller than the second. *Pandion* thus agrees with the anseriform birds in having more coverts than rectrices. The owls are notable among land birds in having the number of coverts exceeding that of the tail-feathers. The first is often smaller than the second as in *Pandion*. In *Bubo*, *Megascops*, *Nyctea*, *Glaucidium*, *Asio* and *Nyctala* we find 6-7. In nestlings of *Bubo* and *Asio*, the arrangement is 6-8, indicating a very recent loss in owls, of the eighth covert.

CORACIIFORMES. The kingfishers (*Ceryle* and at least one unidentified genus) have the passerine arrangement, 6-5, a covert over each rectrix except 1. In the Cypseli (*Chætura*), Trochili (*Archilochus* and 2 or more unidentified genera) and Caprimulgi (*Chordeiles*, *Antrastomus*) the formula is 5-5, a covert nearly over each rectrix. In the only motmot examined, *Baryphthengus*, the formula 5-4 occurs; I have noted it in no other bird. The coverts lie over rectrices 2-5.

TROGONES. The Cuban trogon, *Priotelus*, is the only member of this order available to me and it has the typical passerine arrangement, 6-5.

COCCYGES. Some unidentified Brazilian cuckoos agreed with *Coccyzus* in the formula 5-5, each covert agreeing well in relative size and position with the rectrices.

PSITTACIFORMES. All the parrots I examined (*Conuropsis* and at least two different, unidentified genera) agreed in the passerine arrangement 6-5 and showed no peculiarities of their own. Two of the genera lacked the oil-gland.

SCANSORES. Only toucans have been accessible to me, of this

order, and of these only two genera. In *Selenidera*, we find what is probably the typical arrangement, 5-5, the inner coverts alternating with the rectrices but the outer ones lying over them. The extraordinary condition found in *Ramphastos cuvieri* is described above (p. 117).

PICIFORMES. The normal formula for woodpeckers seems to be 6-6, but the sixth covert is small and may be wanting, giving the passerine formula, 6-5. Owing to a line of contour feathers extending down on each side of the pygidium and joining the series of major coverts it is difficult to determine beyond question where the coverts end. In the larger woodpeckers, particularly in *Phlœotomus*, the middle rectrices are so stout the major coverts seem to have been pushed further to the side than usual, so that covert 1 lies between rectrices 2 and 3, covert 2 is between 3 and 4, 3 is over rectrix 4, 4 is over 5 and 5 and 6 are over 6. The genera examined are *Colaptes*, *Melanerpes*, *Dendrocopus*, *Picoides* and *Phlœotomus*.

PASSERIFORMES. All the specimens of passeriform birds examined showed the characteristic 6-5 arrangement, the middle pair of rectrices apparently lacking coverts. Study of developmental material alone can decide whether covert 1 is really wanting or is merely displaced, though it seems probable that the latter is the case. The genera examined, selected quite at random, are *Tityra*, *Xanthoura*, *Turdus*, *Trochalopteron*, *Acanthorhynchus*, *Petrochelidon*, *Bombycilla*, *Piranga* and *Hedymeles*.

The question as to the significance of the data given above is interesting but deductions must be drawn with care from such fragmentary material. The subject is just opened up in this paper and much more work must be done before the importance to be attached to the condition of the major coverts can be determined. It is possible that habits may play an important part in the arrangement of the coverts in some cases. The recent interesting discoveries of Mr. C. W. Beebe regarding the nestlings of toucans and the way they hold their tail suggests that the extraordinary arrangement of the major coverts in *Ramphastos cuvieri* is the possible result of such a habit. Whether there is any phylogenetic significance in the number and character of the major, upper coverts remains to be discovered but it is at least suggestive that the

flamingos are distinctly anseriform in this particular. Finally it may be added that the study of the under tail-coverts has never been undertaken and will probably give results as interesting and suggestive as those afforded by the study of the major upper coverts.

FERRUGINOUS STAINS ON WATERFOWL.

BY FREDERIC H. KENNARD.

SEVERAL years ago at a meeting of the Nuttall Ornithological Club at which I was present, there was an informal discussion among some of the members, regarding the ferruginous suffusion that occurs so frequently on the heads of certain geese, especially the Snow Geese and Blue Geese.

Some of those present seemed inclined to the belief that it might be a phase of adult plumage, while others thought it merely a rusty stain, such as occurs sometimes on the under parts of many of our ducks.

One eminent ornithologist then pertinently inquired, why, if it were a stain, it should be so strictly confined, as a rule, to the forehead and cheeks, with swans as well as geese, and why also it should occur in certain species of waterfowl, but not in others having essentially the same habits and haunts. Another member wisely suggested that a chemical analysis should be made of some of the rusty feathers in question; but nothing further was done at that time.

Personally, I had, without giving much thought to the subject, always supposed this to be a stain caused by extraneous matter deposited in some way by the muddy water in which the birds fed.

During the winter of 1916, my interest in this subject was again awakened, while on a collecting trip after Blue Geese along the Louisiana marshes bordering the Gulf of Mexico, and I have been able, during the past year, to gather data from a number of museums and private collections, which included large series of skins

of the genus *Chen*, Blue Geese, Lesser and Greater Snow Geese, and Ross's Geese, as well as a series of Emperor Geese, all apt to be more or less stained about their heads; and a series of the Canada group of the genus *Branta*, including the Canada, Hutchins', and Cackling Geese, apparently having essentially the same habits and haunts, but which nevertheless remain practically unstained throughout the year.

In view of the fact that there still seems to be a good deal of uncertainty among some of our ornithologists regarding these ferruginous suffusions, the following notes, in which I have tried to answer the questions raised at the Nuttall Club meeting, may be of interest.

During the summer of 1917, Professor S. C. Prescott of the Massachusetts Institute of Technology very kindly offered to make a chemical analysis of such stained plumages as seemed necessary. He examined feathers from various parts of Blue Geese, Greater and Lesser Snow Geese, Mallards, Gadwalls, Blue-winged Teal, Green-winged Teal, Baldpates, Shovellers, Canvas-backs, Ring-necked Ducks, and Ruddy Ducks, and reported that "the results of these analyses in all cases showed that the coloration was due to iron, which was deposited in the form of ferric oxide (Fe_2O_3) on the tips of the feathers. The white feathers showed the coloration most pronouncedly, as was to be expected, but even the dark brown and black feathers of some species showed the presence of the iron. It is easy to show by micro-chemical methods that the oxide of iron is deposited on the outside of the feather, and does not penetrate into the tissue."

Professor Prescott also writes that "it seems to me quite likely that different kinds of feathers from the same bird will exhibit differences in the degree of coloration they are likely to undergo. The colored feathers have a different chemical structure, and will be less stained, just as colored cloths will dye less readily than white ones."

One of the birds that we examined, for instance, an adult male Ring-necked Duck, collected among the sloughs of the Mississippi Delta, had its white belly completely covered with stain, while its black breast appeared nearly as glossy as that of an unstained bird, and yet these same black feathers gave a positive reaction of oxide

of iron. An adult Mallard drake, collected on the Mississippi Delta, was badly stained all over its belly, and the dark feathers of its breast, on which the stain was hardly noticeable, gave a positive reaction. The white collar was badly discolored, while the iridescent green feathers of the neck immediately above the collar, apparently just as glossy and green as ever, also gave a positive reaction.

In the meantime Mr. H. S. Swarth, of the University of California, called my attention to a similar investigation away back in 1910 by Dr. Joseph Grinnell, which had previously escaped my notice,¹ in which he writes as follows regarding the Red-throated Loon,—“Common, and thought to be breeding about the head of Cordova Bay. Two adult specimens, taken there June 9 and 10, have the entire lower surface, where it is normally snowy white, of a bright ferruginous tinge. This color is intensest on the exposed portions of the feathers, suggesting adventitious origin. . . . Dr. M. Vaygouny of the Department of Chemistry of the University of California, determined by analysis that the discoloration is due to the presence of ferric oxide (Fe_2O_3), probably deposited from the water of the marshes in the immediate locality. As the Red-throated Loon moults in the spring, the discoloration must have been acquired since April 1; and furthermore, the species probably does not arrive from the south until that date at earliest. Therefore, the deposit has been surprisingly rapid. The iron oxide in the water is said to result from bacterial action, and precipitation is liable to occur freely on organic substances of certain textures. Evidently the loon's feathers are especially favorable. The same deposit was noticed to a less extent on certain other birds of the same locality, as hereinafter noted.”

Again in the same publication, Dr. Grinnell writes of three Northern Phalaropes, collected at the Head of Cordova Bay, June 11 to 14, which “have the lower surface of the body rusty-stained, as in the case of the loons from the same place before described.”

The stain is very persistent, but invariably disappears with the moulting of the feathers, when the bird is in captivity, or when the

¹ Birds of the 1908 Alexander Alaska Expedition with a Note on the Avifaunal Relationships of the Prince William Sound District, by Joseph Grinnell, University of California Publications in Zoölogy, Vol. 5, No. 12, March 5, 1910.

bird has changed its feeding ground to a locality where there is no ferric oxide present.

The next question is,—why, when the stain does occur, should it be confined so generally to the heads of the birds under consideration. As a matter of fact, it is not so strictly thus confined as many people seem to suppose, but occurs frequently on their bellies and tibiæ, and less often on their breasts.

In the case of the Blue Geese, with whose feeding habits I am familiar, the stains on their heads seem undoubtedly due to their method of feeding about the shallow sloughs among the marshes and flats along the Louisiana coast. The crops of all those birds which I have examined, which contained anything at all, were full of the roots of certain tall, grass-like plants, which grew about the shallow sloughs and wet flats, but which I did not identify. What seems a simple explanation is, that the feeding bird, standing in the shallow water with his belly usually clear of the surface, sticks its head beneath the surface and digs with its bill in the mud among the roots of the grasses and decayed vegetation, riling the muddy water, and gradually by repeated application acquiring a deposit of oxide of iron upon its forehead and cheeks, and perhaps the rest of the head and neck. It is possible that the alternate wetting and drying may aid in the deposit. If the water be deep enough, so that the tibiæ, belly and breast become immersed, these parts of the plumage may also become discolored. The deposit seems to be rapidly acquired.

Mr. W. L. McAtee of the Biological Survey has written very fully of the habits of the Blue Goose in feeding on the roots of certain grasses.¹

I am not personally familiar with the feeding habits of the other members of the genus *Chen*, except with those of the few Lesser Snow Geese that consort with the Blue Geese in southern Louisiana. Their feeding habits, so far as I have been able to observe, are exactly like those of the Blue Geese, digging just as they do for their food among the grass roots of the marshes and shallow sloughs. It seems reasonable to infer, however, that the other members of

¹ Notes on *Chen caerulescens*, *Chen rossi*, and other Waterfowl in Louisiana. 'The Auk,' July, 1910, pp. 337-339.

the *Chen* group, the Greater Snow Goose and Ross's Goose, and also the Emperor Goose, all of which are apt to become discolored about their heads, undoubtedly acquire the stain in the same way, viz., — by digging.

The last question,— why the rusty stains occur with certain species of waterfowl, but not with others having essentially the same habits and haunts,— is perhaps more difficult to answer definitely, owing to our lack of knowledge of the habits and haunts of some of them. The breeding ground of the Blue Goose is unknown, but was supposed by Professor Wells W. Cooke to be somewhere in the interior of Ungava in the northern part of the Labrador Peninsula,¹ and the bird has been reported from Baffin Land.² I find, on looking over a series of more than a hundred Blue Geese, that adults taken early in their autumn migration, are usually unstained or very slightly so, while the juvenal and immature birds are free from discoloration. On the other hand, all the Blue Geese, taken during the winter, along the Louisiana marshes, are more or less stained. Those taken nearest the Mississippi Delta seem to be most discolored; and those taken in Cameron Parish less so; while birds collected in Galveston Bay, Texas, are apt to be comparatively free from stain. Of the young birds that arrive in Cameron Parish early in October, those which were hatched late and are still in juvenal plumage are unstained. As soon, however, as they begin to moult and to show white feathers about their heads and necks, these feathers begin to acquire the rusty stain, while similar birds taken in Galveston Bay remain comparatively unstained.

Wherever the breeding range of the Blue Goose may be, it appears that those birds which have acquired the stain while wintering in the South, lose it during their summer moult, and as a rule start south unstained. Those birds that fly south along the Mississippi River may acquire the stain anew, while feeding among the bordering bayous and sloughs, while those that fly farther west, and come down into Texas, may remain unstained.

Of the Lesser Snow Geese examined, about fifty per cent were

¹ Distribution and Migration of North American Geese, Ducks and Swans, U. S. Dept. of Agriculture, Biological Survey, Bulletin 26.

² Bernard Hantzsch's Ornithologische Ausbeute in Baffinland by Dr. Erich Hesse, in 'Journal für Ornithologie,' April, 1915.

unstained. Adults, when they reach their winter range, may or may not be discolored, while the young of the species usually arrive unstained. Louisiana birds become more stained during the winter, while Texas birds remain comparatively unstained. In California, where the Lesser Snow Goose and Ross's Goose winter in large numbers, together with various kinds of Canada Geese, in the San Joaquin and Sacramento Valleys, the percentage of stained birds is comparatively small. Mr. Swarth writes: "I note on our California collected birds that this stain is most apparent on specimens collected through the fall. In such birds as undergo more or less of a moult during the winter or early spring, it seems to disappear by April. The inference is, that it is acquired in their northern home." I have never visited these valleys, but am told that the birds feed among grain fields, pastures, and adjacent swamps, instead of muddy sloughs, as in the Louisiana marshes. The conclusion is obvious, that these birds lose their stain because of the absence in this locality of muddy, iron-bearing waters such as are found in the Louisiana marshes.

We are told by Prof. Cooke, that the breeding range of the Lesser Snow Goose reaches from the mouth of the Mackenzie River east to Coronation Gulf and the Melville Peninsula; and the bird has since been taken on Banks Island.¹ In all this expanse of country, conditions must vary greatly, and it seems reasonable to suppose that those geese that moult and summer among fresh water ponds remain unstained, while those birds that live about the deltas, or muddy flats along the iron-bearing rivers may, after they moult, acquire the stain which they bring south with them. To put it more concisely, it appears that the Lesser Snow Goose may or may not acquire the stain upon its northern range. Those birds that do acquire it, lose it if they start moulting upon their winter range in California, while those birds that winter along the marshes bordering the Gulf of Mexico are apt to become more stained the nearer they are to the mouth of the Mississippi River.

Very little is known of the breeding range and habits of the Greater Snow Goose. Prof. Cooke seemed to think it probable that they "breed for the most part in Victoria Land," though

¹ Summary Report of the Geological Survey, Department of Mines, Canada, 1916.

I have found no record from there. They have, however, been taken in Labrador and a breeding female and downy young were secured in north Greenland. Wherever their summer range may be, the only unstained specimens examined were young birds taken early in October; while over ninety-five per cent of them, both immature and adult, come south discolored about their heads; and a majority of them also about their tibiae, bellies, and breasts, with a stain that must have been acquired after their summer moult, either upon their breeding grounds or somewhere in their northern range. As they come south later than the Lesser Snow Goose, usually not arriving on the Atlantic Coast before the latter part of December, they have apparently had more time to acquire the stain, which is usually much heavier than in the case of the Lesser Snow Goose, which arrives south in October. Prof. Cooke writes that "there is no sharply defined line in the Mississippi Valley between the winter ranges of the greater and the lesser forms. In general the greater snow goose is more common east of the Mississippi River, and winters from southern Illinois to the Gulf."

The Greater Snow Goose doubtless occurs as a straggler along the Mississippi Valley, just as we occasionally get a Blue Goose or a Lesser Snow Goose on the Atlantic Coast; I have seen a number of specimens erroneously tagged *Chen hyperboreus nivalis*; but out of the large series of skins examined I have seen only two from the Central States really referable to that subspecies, and these had wandered clear out to Dakota.

These birds seem to winter along the Atlantic Coast from New Jersey to North Carolina, feeding there along the sandy beaches, or adjacent flats thrown up by the action of the sea, and presumably free from iron deposit.

The breeding range of the Ross's Goose is, like that of the Greater Snow Goose, still unknown; but wherever it may be in the far north, while this bird is not so frequently discolored as its larger cousins, the Greater Snow Geese, a small proportion of them do acquire the stain sometime after the summer moult, which they bring to California, and like their cousins, the Lesser Snow Geese, lose it there, when they start moulting.

The breeding range of the Emperor Goose extends along the west coast of Alaska from the Kotzebue Sound south to the Kuskokwim

River, principally about the delta of the Yukon River. The birds are also found in East Siberia, and are said to winter among the Aleutian Islands. Owing to the comparative rarity of this species, I have been able to examine but thirty-three specimens. Of these, seven were unstained; one taken on Bristol Bay, Alaska, on May 16, and the other six September birds, either juvenal, or adults that had but recently finished their moult. The remaining birds were all stained, those from East Siberia slightly so, while those from Alaska were very badly discolored.

I have been unable to obtain any data as to their stomach contents; but Mr. F. Seymour Hersey tells me that they are marsh feeders, reminding him in their habits of the Blue Goose, with the feeding habits of which he is also familiar. These birds apparently acquire this stain along the marshes of the west coast of Alaska, and about the Yukon Delta, and presumably their feeding habits must be similar to those of the genus *Chen*.

Let us now turn to the Genus *Branta*, which seems to remain unstained throughout the year. We know more about the range, both winter and summer, of the Canada Goose, a stained specimen of which is very exceptional, and we might logically argue that its unstained condition throughout the year is owing to the fact that, while its breeding range is enormous, it really is a bird of the interior, breeding usually about the clean fresh-water ponds and lakes rather than among the deltas and flats of the sea-coast; and wintering generally either in the country west of the Mississippi, or on the Atlantic Coast, and away from the muddy iron-bearing waters of the Mississippi Delta.

In what way, however, are we to account for the fact that the Hutchins' Goose, which winters in California, together with the Lesser Snow Goose, and which breeds in the Kowak Valley in Alaska, and from the mouth of the Mackenzie east along the Arctic shore to the Melville Peninsula, remains unstained, and in practically the same range, as that in which the Lesser Snow Goose often becomes discolored? In this case, the haunts are approximately the same.

The Cackling Goose breeds along the west coast of Alaska from Kotzebue Sound south across the Yukon Delta to the Alaska Peninsula throughout approximately the same range as the Emperor

Goose, and remains as a rule unstained. I have examined a few Cackling Geese with cheeks slightly stained, but discolored specimens of this species, as well as of the Hutchins' and Canada Geese, are so uncommon as to be negligible.

I have not attempted to gather any data regarding the other members of the *Branta* group. The White-cheeked Goose, a bird of the Pacific slope, has presumably habits similar to its cousin, the Canada Goose, and but seldom acquires the stain, while the Brant are salt-water birds.

The dark feathers of the heads and necks of this group of birds naturally do not show the stain as do those with the white heads; but their cheeks should show it, if present, and their lower parts as well. Such stains are, however, very exceptional, and the deduction seems reasonable, that their feeding habits cannot be the same. According to a letter from Mr. McAtee, "the stomach contents bear out this idea. *Branta* contains more largely things which may be cropped and few root stocks; while *Chen* has more largely the latter. On the whole also, *Branta* spends more time in the water than *Chen* and feeds more on water plants, while *Chen* feeds more on land, where not only digging, but often hard digging is required to get the things it wants."

As a summary of the above notes, and in answer to the questions asked at the Nuttall Club meeting, it seems to be proven:

First: That the ferruginous suffusion is caused in every case by an extraneous deposit of oxide of iron (Fe_2O_3) on the outside of the tips of the feathers;

Second: The stain upon the heads of certain of our geese seems undoubtedly to be brought about by their habit of digging for their food among the mud and decayed vegetation in the iron-bearing waters of the marshes and shallow sloughs, among which they feed at certain seasons, particularly in places adjacent to the deltas of the great muddy rivers;

Third: Those species of the *Branta* group which remain unstained, and inhabit essentially the same haunts as those of the *Chen* group or the Emperor Geese, which become stained, do not have the same feeding habits. They are apt either to frequent deeper waters where they feed upon the grasses and aquatic plants, or else they are found upon the drier fields and prairies in preference to shallow

muddy sloughs; and they are as a rule croppers rather than diggers.

In general, it appears that swans, geese, and ducks, or other waterfowl, may become stained if their feeding habits bring them among iron-bearing waters; particularly about the deltas of such great muddy rivers as the Mississippi, the Mackenzie or the Yukon.

Swans frequently acquire the stain about their heads somewhere on their summer range, but those that winter in the east appear to lose it during their sojourn on the Atlantic Coast, while those wintering on the Gulf are apt to retain it.

Those ducks that winter along the Atlantic Coast remain, as a rule, unstained while those wintering along the Louisiana Coast, particularly about the Mississippi Delta, are apt to become badly stained.

While these notes have been limited to the few species actually examined chemically, there are many others that appeared to be similarly stained, both from this country and abroad.

In assembling the data, upon which these notes are necessarily based, I am indebted, not only to the ornithologists already mentioned, but to several others who have very kindly supplied me with data from collections to which they had access. My thanks are particularly due to Messrs. Bangs, Bent, Bishop, Brewster, Dwight, Fleming, Oberholser, Osgood, Stone, and Taverner, members of the A. O. U.; and to Messrs. E. A. McIlhenny of Avery Island, Louisiana, and John Heywood of Gardner, Mass., game conservationists.

THE DESCRIPTION OF THE VOICE OF BIRDS.

BY R. M. STRONG.

It was with no small interest that I followed a recent controversy¹ in 'The Auk' over the use of musical signs in describing the voice of birds. We have all read and heard much on this subject. We not only have a very difficult problem in the description of bird voice but we also have a lack of suitable terms for the sounds made by birds. There is, for instance, no really good word to designate single bird sounds except for the word note, which is unsatisfactory in several respects. After considerable study of various possible expressions, which might be used to designate sounds in general made by birds, I adopted "voice" as a term.

I have had an experience of twelve years with about twenty classes of university students in a course which included teaching bird voice. During that time, I have tried out various methods and the following account is a result.

It has been my experience that descriptions of bird voice mean very little until one has heard the performance or a good imitation of it. Then descriptions often help in an identification or assist in efforts to memorize the song. I have tried reproducing musical-scale records of bird songs on various musical instruments, but without getting anything that sounded like the bird's performance. Nor have I known anyone else who has had a different experience.

In conducting class work with birds, I have not found the use of musical scales or of modifications of them often practicable. I have been able furthermore, to teach people without musical ability to recognize many birds by their voice. Occasionally, students with sufficient musical ability and training to use musical-scale symbols occur, but even they have depended largely on other methods in my classes.

¹ Methods of Recording Bird Songs.

Moore, R. T. *Auk*. XXXII. Oct., 1915, pp. 535-8.

" " " XXXIII. April, 1916, pp. 228-9.

Saunders, A. A. *Auk*. XXXII. April, 1915, pp. 173-183.

" " " XXXIII. Jan., 1916, pp. 103-7.

" " " XXXIII. April, 1916, pp. 229-230.

It is my practice to subject the vocal performances of birds to analyses which may be employed with the voice of other groups of animals. In fact, some of my first ideas on the subject came from a study of methods used by Professor Reighard of the University of Michigan, in studying the voice of frogs and toads.

The following features are of first importance, in my experience, when the voice of a bird is heard for the first time: duration, quality, loudness, general pitch, complexity, accent, stress, and relation to known sounds.

Under duration, we note the time occupied by a vocal performance. If simply a chirp, for instance, we indicate whether it is short or relatively long. Longer performances are measured in seconds, the number of which is usually surprisingly less than would be estimated without timing.

Quality is of course important, and it may be described in many ways. One of the first things I have students do is to observe whether the sound is relatively musical or unmusical. Some bird sounds are not easily classed as either, but a great number can be so distinguished. Thus, I find no one hesitating to call the voice of the Wood Thrush musical and that of the Kingbird unmusical.

The first time I take up bird song with students, I discuss the relation of overtones to quality of sound and some other principles of physics pertinent to the subject. Such terms as rich, thin, bell-like, flute-like, resonant, reedy, metallic, rasping, harsh, etc., are helpful in describing quality. It is also very useful to make comparisons with other known sounds.

Under general pitch, we observe whether the voice is relatively high or low in pitch. As might be expected, the results are variable, but the effort is worth while in establishing associations for the student. Occasionally, students with sufficient musical equipment are encouraged to use musical scale symbols also. Any other system which the student finds practicable for describing pitch variations is encouraged. It is of course pointed out that birds do not sing according to the musical scale and that musical scale records are only approximate at best, especially because of variability in vocal performances.

Under complexity, are included some of the most important characteristics of bird voice. Is the vocal performance a single

note or do we have more than one note? If more than one note occurs, how many? Is the song relatively intricate or simple? Do the notes come in rapid succession? May they be grouped and how? The first notes of the song of the Song Sparrow, for instance, form a distinct group with a pitch, quality, loudness, and tempo which are exceedingly characteristic for the bird. They at once suggest the species to anyone familiar with the song, before the balance of the song is produced.

The description of that portion of the Song Sparrow's song which follows the opening group of notes is difficult, and very variable results are obtained by different students. Even though the attempts are not uniformly successful as descriptions of the song, the efforts involved are worth while for the student.

The occurrence of accents or stresses must be noted. I have found these especially important in studying the songs of warblers, for instance. The songs of the Robin, Red-eyed Vireo, Baltimore Oriole, Scarlet Tanager, and Rose-breasted Grosbeak are more or less indistinguishable to beginners. I find that the study of variations in accent, stress, and grouping of notes helps greatly in learning to distinguish the songs of these birds.

The song of the Winter Wren is notable for its unusual complexity and duration. As I have heard this song in northern Michigan and Wisconsin, a group of notes which occurs at the end is peculiarly characteristic and helpful in teaching others to learn to recognize the song. It consists of a series of very thin and rapidly repeated notes with a decided diminuendo at the end. There is a tendency to "sharp," i. e., to rise slightly in pitch towards the end of the series. The last notes at the ordinary distance one hears the song are barely audible, and the whole song seems to fade out into silence.

These methods are not only useful for students, but they are the only schemes which I have found worth while for my own studies of bird voice.

NOTES ON THE BREEDING BIRDS OF PENNSYLVANIA AND NEW JERSEY.

BY RICHARD C. HARLOW.

(Continued from p. 29.)

74. **Otocoris alpestris praticola.** PRAIRIE HORNED LARK.—An irregularly distributed breeding bird over most of Pennsylvania north of Northampton, Schuylkill, Northumberland, Cumberland and Franklin Counties. I have found it nesting on the Pocono plateau and in Huntington, Center, and Greene Counties. Data on seven nests give: average set, 3 (4–5); average date, March 25 (March 18); a second set, May 20.

75. **Cyanocitta cristata cristata.** BLUE JAY.—Breeds commonly, though in some places locally, throughout both states. Data on sixteen nests give: average set, 5 (4–6); average date, May 5 (April 29–June 17).

76. **Corvus corax principalis.** NORTHERN RAVEN.—Does not now breed in New Jersey and is nearing extinction in Pennsylvania, making a last stand in the mountains of Snyder, Mifflin, Center, Blair, Clinton, Union, Juniata and Huntington Counties. During 1917 only one pair out of five previously located was present. Nests have seldom been found nearer together than thirty miles, and all have been located on cliffs with one exception, that one being in a pine tree. Data on ten nests give the following: average set, 5 (4); average date, March 4 (February 27–April 12).

77. **Corvus brachyrhynchos brachyrhynchos.** CROW.—Nests abundantly throughout, even along the sea coast of New Jersey with the Fish Crows. Data recorded on 194 nests give: average set, 5 (3–6); average date April 10 (March 26–May 20).

78. **Corvus ossifragus.** FISH CROW.—Nests commonly through southern New Jersey being especially abundant in Cape May County where they breed in colonies as well as singly. In Pennsylvania I have found them nesting in the valleys of the Delaware and Susquehanna as far north as Bucks and Dauphin Counties. Data on thirty-two nests give: average set 5 (4–6); average date, May 14 (April 19–May 24).

79. **Sturnus vulgaris vulgaris.** STARLING.—Now breeding over practically the entire state of New Jersey and well established in Pennsylvania as far west as Altoona, Blair County. It reached Wayne and Center Counties and bred there in 1917. Data on eleven nests give: average set 5 (4–6); average date, April 28 (April 20–May 14).

80. **Dolichonyx oryzivorus.** BOBOLINK.—Very locally distributed in Pennsylvania in the breeding season. They occur regularly as near Philadelphia as Ambler, Montgomery Co. and Newtown, Bucks Co., and I once saw a pair as far south as Tinicum, Delaware Co., where however,

their breeding must be accidental. I have found them common in Warren Co., scarce in Pike, Wayne and Center Counties and one colony in Fayette Co., the most southern locality known to me. They are reported breeding in northern New Jersey but I have had no personal experience in that region. I have data on three nests: 1, Warren, Warren Co., June 2, 1912, six eggs; 2, State College, Center Co., May 30, 1915, four eggs; 3, Oak Hall, Center Co., May 31, 1915, five eggs.

81. *Molothrus ater ater*. COWBIRD.—Fairly common but local in southern New Jersey and somewhat local in Pennsylvania being scarce in the mountainous sections. Data on forty-five eggs: average date May 28 (May 9–June 24). Most in a single nest three, in the nest of a Field Sparrow.

82. *Agelaius phoeniceus phoeniceus*. RED-WINGED BLACKBIRD.—Abundant breeder throughout, but rarer in the northern counties of Pennsylvania. Data on 136 nests give: average set, 4 (3–5); average date, first sets, May 18 (earliest May 7), second sets, June 15 (latest August 4).

83. *Icterus spurius*. ORCHARD ORIOLE.—Generally common throughout southern New Jersey. Common in Pennsylvania south of the middle of the state; absent in the northern counties and in the mountains. Breeds regularly in Center County. Data on twelve nests give: average set, 4 (3–5); average date, May 30 (May 25–June 12).

84. *Icterus galbula*. BALTIMORE ORIOLE.—I have not found this species nesting in New Jersey south of the latitude of Philadelphia. In Pennsylvania it is rather scarce in the southern counties but very common in the northern half of the state. Data on thirty-seven nests give: average set, 5 (3–6); average date, May 28 (May 23–June 20).

85. *Quiscalus quiscula quiscula*. PURPLE GRACKLE.—Nests commonly throughout both states east of the mountains even in some of the ridges east of the main Alleghanies and at Tobyhanna in the Poconos. Data on seventy-two nests give: average set, 5 (3–6); average date, April 28 (April 22–May 14).

86. *Quiscalus quiscula æneus*. BRONZED GRACKLE.—Nests very commonly west of the Alleghanies. Nests and dates differ in no respects from those of the last.

87. *Carpodacus purpureus purpureus*. PURPLE FINCH.—I have found the Purple Finch breeding commonly only in Monroe and Warren Counties and once in Pike. Of three nests found in Monroe County between June 9 and June 16, one contained four half fledged young and two were just being completed.

88. *Loxia curvirostra minor*. RED CROSSBILL.—The sporadic nesting habits of the Crossbill render its breeding possible almost anywhere. It undoubtedly nests at times in the mountainous districts of Pennsylvania and I have seen small flocks in summer rarely in Pike and Wayne Counties, while in Center County, on March 26, 1916, I found two mated pairs, the males singing.

89. *Astragalinus tristis tristis*. GOLDFINCH.—Breeds commonly

though sometimes locally throughout both states. Data on fifty-three nests give: average set, 5 (3-6); average date, July 26 (July 10-September 3).

90. **Spinus pinus**. PINE SISKIN.—The same remarks apply to this species as to the Crossbill. During the spring of 1917 they remained until May 15 in Center County and until June 8 in Wayne but showed no intention of breeding. A large number did nest in Warren County, however, in 1912, and a set of three eggs taken there on April 30, 1912, is in my collection.

91. **Poecetes gramineus gramineus**. VESPER SPARROW.—Very common, breeding throughout. Data on twenty-six nests give: average set, 4 (3-5); average date, May 8 (May 2-June 13).

92. **Passerculus sandwichensis savanna**. SAVANNAH SPARROW.—I have failed to find this bird breeding in southern New Jersey. In Pennsylvania it breeds most commonly in Warren County so far as my experience is concerned; regularly but rather uncommonly in Center County, and rarely in Pike and Wayne. These remarks are based mainly upon the presence of the birds in summer as I have found but two nests: 1, State College, Center Co., Pa., July 20, 1911, two eggs; 2, Warren, Warren Co., Pa., May 19, 1912, four eggs.

93. **Ammodramus savannarum australis**. GRASSHOPPER SPARROW.—Locally common in both states but becoming rare in the northern mountainous counties of Pennsylvania. I noted it in summer for the first time in Wayne and Pike Counties in 1917, one pair in each. Data on ten nests give: average set, 4 or 5 (rarely 3); average date, May 28 (May 22-August 4).

94. **Passerherbulus henslowi henslowi**. HENSLOW'S SPARROW.—Breeds regularly and fairly commonly in Ocean, Burlington, Atlantic and Cape May Counties, New Jersey. In 1913 I discovered a small colony. in Huntington County, Pennsylvania, my only breeding record for the state. Data on nine nests from New Jersey and three from Pennsylvania give: average set, 4 (rarely 5); average date, June 4 (May 26-July 16).

95. **Passerherbulus caudacutus caudacutus**. SHARP-TAILED SPARROW.—Breeds commonly on the coast marshes of New Jersey where I have found it much more plentiful than the Seaside Sparrow, especially from Atlantic to Ocean County. Data on forty-five nests give: average set, 4 (sometimes 5); average date, June 4 (May 26-July 12).

96. **Passerherbulus maritimus maritimus**. SEASIDE SPARROW.—Common breeder on the New Jersey coast marshes, being more abundant in Cape May County than elsewhere. Data on nine nests give: average set, 4 (3-5); average date, June 2 (May 30-July 5).

97. **Chondestes grammacus grammacus**. LARK SPARROW.—I saw a pair of these birds on May 11, 1914, evidently breeding, near Alleghany, Pa.

98. **Zonotrichia albicollis**. WHITE-THROATED SPARROW.—I have noticed this bird as a fairly common summer resident at Pocono Lake, Monroe County, Pa., and nests have been found there by others.

99. *Spizella passerina passerina*. CHIPPING SPARROW.—Generally abundant. Data on sixty-seven nests give: average set, 4 (2-3); average date, May 15 (May 11-July 6).

100. *Spizella pusilla pusilla*. FIELD SPARROW.—Generally abundant. Data on ninety-four nests give: average set, 4 (3-5); average date, first sets, May 8; second sets, June 20; latest August 6.

101. *Junco hyemalis hyemalis*. JUNCO.—I have found the Junco breeding regularly in the following counties in Pennsylvania: Pike, Monroe, Wayne, Sullivan, Lycoming, Cameron, Elk, Forest, Clinton and Blair, and far more commonly in Warren. It also breeds in Fayette County and the question arises whether these latter birds may not be referable to the Carolina form. Data on sixteen nests give: average set, 4(3-5); average date, May 20 (May 12-July 20).

102. *Melospiza melodia melodia*. SONG SPARROW.—One of the most abundant and regularly distributed birds. Data on 172 nests give: average set, 4 or 5; average date, May 4 for first sets, earliest, April 26; June 20 for second sets, latest, August 10.

103. *Melospiza georgiana*. SWAMP SPARROW.—In New Jersey I have found the Swamp Sparrow nesting only on the Delaware marshes. It does not seem to occur in summer along the coast. In Pennsylvania it nests abundantly along the Delaware marshes as far north as Bucks County and it outnumbers all the birds found in the localities where it breeds. Sometimes I have found as many as twenty-five nests in a single day. In northern Pennsylvania I have not found it, but it nests in Fayette County in the southwestern part of the state. Data on 186 nests give: average set 4 (3-5, and in one instance 8, although this was certainly a case of two birds making use of the same nest); average date, May 28 (May 14-July 12).

104. *Pipilo erythrophthalmus erythrophthalmus*. TOWHEE.—Common and generally distributed. Data on fourteen nests give: average set, 4 (3-5); average date, May 20 (May 15-August 4).

105. *Cardinalis cardinalis cardinalis*. CARDINAL.—Common in New Jersey south of Trenton, and in southern Pennsylvania, extending farther north along the river valleys, and as far as Center County where it breeds rarely but regularly. Nests also in Greene County in the southwestern corner of the state. Data on sixteen nests give: average set, 3 (2-4); average date, May 1 (April 8-July 15).

106. *Zamelodia ludoviciana*. ROSE-BREADED GROSBEAK.—In New Jersey I have found it nesting only along the Delaware above Trenton, while in Pennsylvania it breeds regularly near Newtown, Bucks County, and I have found it in summer in the following counties: Pike, Monroe, Wayne, Warren, Clarion, Venango and Alleghany, being especially common in the last. Data on nine nests give: average set, 4 (3-5); average date, May 25, latest, June 13.

107. *Passerina cyanea*. INDIGO BUNTING.—Common and generally

distributed. Data on thirty-seven nests give: average set, 4 (sometimes 3); average date, June 4 (May 28–August 15).

108. **Piranga erythromelas.** SCARLET TANAGER.—Regular but rather scarce breeder in southeastern Pennsylvania and southern New Jersey but much more common in the northern and mountainous portions and in southwestern Pennsylvania. Data on fourteen nests give: average set, 3–4 (rarely 5); average date, June 3 (May 26–August 14).

109. **Progne subis subis.** PURPLE MARTIN.—Common summer resident in Cape May, Cumberland, Atlantic, and Burlington Counties, New Jersey. Very local in eastern Pennsylvania where I have found it nesting in Chester and Monroe Counties. A common breeder in Greene County in the southwestern corner. Absent from the northern counties. Data on eleven nests give: average set, 5 (4–6); average date, June 2.

110. **Petrochelidon lunifrons lunifrons.** CLIFF SWALLOW.—Nests abundantly in the northern half of Pennsylvania and locally in the southern counties. I have not found it in southern New Jersey. Data on sixty-two nests give: average set, 4 (3–5); average date, June 4 (May 26–July 2).

111. **Hirundo erythrogastra.** BARN SWALLOW.—Very common summer resident in most of the area but rather scarce in the Philadelphia region. Data on seventy-five nests give: average set, 5 (3–6); average date, May 30 (May 12–July 7).

112. **Iridoprocne bicolor.** TREE SWALLOW.—Breeds commonly in Cape May, Cumberland and Atlantic Counties, New Jersey. In Pennsylvania I have found them only about a few ponds in Pike and Monroe Counties and on a pond at Scotia, Center County. Data on nine nests give: average set 5 (4–6); average date, May 28 (May 19–June 16).

113. **Riparia riparia.** BANK SWALLOW.—Very common summer resident in the Delaware Valley in both states and along the Susquehanna Valley in Pennsylvania. I have not found it elsewhere. Data on forty-five nests give: average set, 5 (4–6); average date, May 20 (May 14–June 18).

114. **Stelgidopteryx serripennis.** ROUGHED-WINGED SWALLOW.—Nests commonly in Camden and Burlington Counties, New Jersey; I have also found its nest once in the pine barrens in Gloucester County and once in a sand dune in Cape May County. In Pennsylvania it breeds regularly in the southern half of the state pushing up the river valleys rarely to Stroudsburg, Monroe County, but commonly to Center County, and has even been found breeding at Warren, Warren County. Data on eighteen nests give: average set, 6 or 7 (5); average date, May 20 for southern Pennsylvania and New Jersey; May 27 for northern Pennsylvania.

115. **Bombycilla cedrorum.** CEDAR WAXWING.—I have never found the Waxwing breeding in southern New Jersey. In Pennsylvania it is fairly distributed but only common in the northern counties. Data on fourteen nests give: average set, 4 (5); average date, June 25 (June 5–August 19).

116. **Lanius ludovicianus migrans.** MIGRANT SHRIKE.—A regular

though not common breeder in Erie County, Pennsylvania, but not known elsewhere except as a migrant. Data on two nests are: 1, East Springfield, Pa., May 8, 1915, four eggs; 2, East Springfield, Pa., May 9, 1915, five eggs.

117. *Vireosylva olivacea*. RED-EYED VIREO.—One of the most abundant breeding birds of the woodland. Data on forty-eight nests give: average set, 3 (2-4); average date, June 6 (May 26-June 14).

118. *Vireosylva gilva gilva*. WARBLING VIREO.—In New Jersey I have found this species nesting only along the Delaware from Trenton to Belvidere. In Pennsylvania it is very local except in the northern and mountainous districts, where it is not found at all. Data on five nests give: average set, 3 or 4; average date, Greene County, May 22; Center County, May 28.

119. *Lanivireo flavifrons*. YELLOW-THROATED VIREO.—I have not found this Vireo nesting in southern New Jersey but from Camden north it is a regular breeder. In Pennsylvania it is a rather scarce though regular breeding bird throughout the state, although contrary to the statement in Stone's 'Birds of Eastern Pennsylvania and New Jersey,' I have found it more commonly in the southern portion. Data on eight nests from Philadelphia, Montgomery, Center and Warren Counties give: average set, 4 (sometimes 3); average date, June 4, earliest May 23.

120. *Lanivireo solitarius solitarius*. BLUE-HEADED VIREO.—A regular and fairly common breeder in the northern and mountainous parts of Pennsylvania from Pike and Warren Counties south to Huntington, breeding as near Philadelphia as the Delaware Water Gap. Data on nine nests give: average set, 4 (sometimes 3); average date, June 4 (May 15-July 2).

121. *Vireo griseus griseus*. WHITE-EYED VIREO.—Very common in the Cedar swamps of southern New Jersey but in Pennsylvania I have found it only as a rather scarce breeder in parts of Delaware and Chester Counties. A set of four eggs was taken in Cape May County, May 23, 1908.

122. *Mniotilta varia*. BLACK AND WHITE WARBLER.—Breeds regularly throughout both states but very scarce in southeastern Pennsylvania; most plentiful in the mountains. Data on twelve nests give: average set, 5 (3-4); average date, May 20 (May 14-June 10).

123. *Helminthos vermivorus*. WORM-EATING WARBLER.—I have never found this species in southern New Jersey. In Pennsylvania it breeds in Chester, Delaware and Bucks Counties and rarely in Philadelphia also in Greene and Alleghany in the western part of the state. It is a Carolinian species but pushes up the valleys to laurel covered hillsides well into the mountains, and I have found it breeding in Huntington and southern Center Counties, in the same ravines with the Canadian and Black-throated Blue Warblers. Data on thirteen nests give: average set, 5 (3-6); average date, for eastern Pennsylvania (5 nests), May 30; for Center County (3 nests), May 26; for Greene County (5 nests), May 25.

124. *Vermivora pinus*. BLUE-WINGED WARBLER.—In southern New Jersey I have found this bird but three times in the breeding season, once

at Bennett and twice at Clementon. In Pennsylvania it breeds commonly in the southeastern counties especially in parts of Bucks, Chester, Delaware, and Montgomery. Data on nineteen nests give: average set, 5 (3-6); average date, May 28 (May 24-June 19).

125. *Vermivora chrysoptera*. GOLDEN-WINGED WARBLER.—I have one summer record for New Jersey, near the Delaware Water Gap. In Pennsylvania it is a regular but very local breeder in Pike, Monroe, Wayne and Huntington Counties; also in Greene and Alleghany Counties in the western part of the state. I have found it most common in Stone Valley, Huntington County. Data on five nests give: average set, 5 (sometimes 4); average date May 25 (May 22-June 4).

126. *Vermivora rubricapilla rubricapilla*. NASHVILLE WARBLER.—I have found the Nashville Warbler only in two northern bogs at Pocono Lake and Tobyhanna, Monroe County, Pa. Two nests are as follows: 1, Pocono Lake, Pa., June 18, 1907, two eggs; 2, Pocono Lake, Pa., June 27, 1914, four eggs.

127. *Compsothlypis americana usneæ*. NORTHERN PARULA WARBLER.—Nests plentifully in parts of Cape May, Atlantic and Cumberland Counties, New Jersey. In Pennsylvania it breeds regularly in Huntington County and along the Alleghanies to Monroe and Pike and west to Warren County. Data on five nests give: average set, 4 (sometimes 3); average date for southern New Jersey, (4 nests) May 24; for Pennsylvania (1 nest) Huntington Co., June 4.

128. *Dendroica æstiva æstiva*. YELLOW WARBLER.—A common breeder in certain places but locally distributed. Data on twenty-one nests give: average set, 4 (3-5); average date, May 26 (May 18-June 23).

129. *Dendroica cærulescens cærulescens*. BLACK-THROATED BLUE WARBLER.—Regular and common breeder from Huntington to Fayette Counties and north to Pike and Warren covering practically all of the mountainous section of the state. Especially common in Pike and Wayne Counties on the Pocono plateau. Data on 35 nests give: average set, 4 (3-5—very rarely 5); average date, May 30 (May 24-June 23).

130. *Dendroica magnolia*. MAGNOLIA WARBLER.—Common breeder in the higher mountains from Blair north to Warren and Pike Counties, Pa. Scarce south of Blair and Center. Data on eighteen nests give: average set, 4 (3-5); average date, June 4 (May 27-June 20).

131. *Dendroica cerulea*. CERULEAN WARBLER.—I have definite breeding records only from Greene and Alleghany Counties where it is a regular summer resident. Data on four nests from Greene Co., give: average set, 4; average date, May 26 (May 20-June 3).

132. *Dendroica pensylvanica*. CHESTNUT-SIDED WARBLER.—In New Jersey I have found it breeding near the Water Gap and in Pennsylvania it is a common summer resident from Fayette and Franklin Counties northward throughout all the mountainous and northern counties. Data on twenty-one nests give: average set, 4 (3-5); average date, June 1 (May 25-June 18).

133. **Dendroica fusca.** BLACKBURNIAN WARBLER.—Nests in the mountainous regions of Pennsylvania from Huntington County north to Warren and Pike, most common northward. I consider its nest the hardest to find of all our nesting birds. Data on seven nests give: average set, 3 or 4; average date, June 1 (May 26–June 29).

134. **Dendroica virens.** BLACK-THROATED GREEN WARBLER.—Same range as the preceding, though strange as it may appear, it seems to be more common in Fayette and Huntington Counties than farther north where the Canadian element is more predominant. Data on eight nests give: average set, 4 (sometimes 3); average date, June 1 (May 24–July 6).

135. **Dendroica vigorsii.** PINE WARBLER.—Common in summer throughout the pine barrens of southern New Jersey. In Pennsylvania it is a rare or local summer resident in the following counties. Huntington, Mifflin, Center, Lycoming, Snyder, Warren, Wayne, Monroe and Pike. On May 14, 1914, I found a nest almost completed in northern Hunting-ton County.

136. **Dendroica discolor.** PRAIRIE WARBLER.—Breeds abundantly throughout southern New Jersey but I have not found it in summer elsewhere. Data on five nests give: average set, 4 (sometimes 3), average date, May 26.

137. **Seiurus aurocapillus.** OVENBIRD.—Breeds commonly and generally through both states. Data on twenty-two nests give: average set, 4 or 5 (sometimes 3); average date, May 25 (May 16–June 28).

138. **Seiurus noveboracensis noveboracensis.** WATER-THRUSH.—A rare breeder in Warren, Clinton, Sullivan and Cambria Counties and common in the most impenetrable Rhododendron swamps of Wayne, Monroe and Pike Counties on the Pocono plateau. I have never found this bird along running streams but always in the swamps where moss covered logs and standing pools of water abound. The nest is very hard to discover. Data on six nests give average set, 4 (3–5), average date, May 26 (May 20–June 6).

139. **Seiurus motacilla.** LOUISIANA WATER-THRUSH.—A rare breeder in southern New Jersey (see Auk, January 1912, p. 105). In Pennsylvania it is rare in the southeastern counties but common along the lower Susquehanna, in Greene County in the southwest, and in Alleghany County. It is also common along the mountains of Center, Huntington and Mifflin Counties where I have found a number of nests, and over the Pocono plateau in Wayne, Monroe and Pike Counties in the same section inhabited by the other species but unlike it always frequenting the cool swift running mountain streams. Data on thirty nests give: average set, 5 (3–6), average date, May 12 (April 26–June 16).

140. **Oporornis formosa.** KENTUCKY WARBLER.—I have but one record of the Kentucky Warbler summering in southern New Jersey (see Stone's 'Birds of New Jersey'). In Pennsylvania it is a typical Carolinian species restricted to the southeastern and southwestern counties. Data on thirty-two nests give: average set, 5 (3–6); average date, May 25 (May 18–June 22).

141. **Oporornis philadelphia.** MOURNING WARBLER.—Breeds regularly in Warren County and I have found them summering regularly but not commonly on parts of Sullivan, Pike and Monroe Counties. A set of five eggs in my collection was taken in Warren County, June 9, 1911.

142. **Geothlypis trichas trichas.** MARYLAND YELLOW-THROAT.—Breeds commonly throughout; from the coast islands of New Jersey to the tops of the Alleghanies. Data on twenty-one nests give: average set, 4 (3-5); average date, May 28 for first sets, earliest May 19; for second sets, July 5, latest July 17.

143. **Icteria virens virens.** YELLOW-BREASTED CHAT.—A common breeder throughout New Jersey, being abundant in suitable localities in the southern counties. In Pennsylvania it is a common summer resident in the Carolinian fauna of the southern part of the state pushing north into Center County, where however, it is rare. It pushes up into mountain clearings as the forest disappears and I have found it in Pike, Wayne and Sullivan Counties, and in 1917 found a pair breeding on the very summit of Bald Knob, one of the highest mountains in Central Pennsylvania. Data on thirty-eight nests give: average set, 4 (3-5); average date, May 28 (May 20-June 25).

144. **Wilsonia citrina.** HOODED WARBLER.—Breeds commonly in the swamps of southern New Jersey. It is especially common in Cape May and Cumberland Counties and I have found it nesting as near to Philadelphia as Clementon, in 1915. In Pennsylvania it nests commonly in the Rhododendron and Laurel thickets of Franklin, Center, Huntington and Mifflin Counties and less frequently in Snyder and Juniata Counties. I have also found it present in the breeding season though rare, in Clinton, Lycoming and Warren where the fauna is pronouncedly Canadian. Data on twelve nests give: average set, 4 (3-5); average date, for four New Jersey nests, May 24; for eight Pennsylvania nests, June 1.

145. **Wilsonia canadensis.** CANADA WARBLER.—Breeds regularly in the mountains of Pennsylvania from Fayette, Junata and Huntington Counties to Warren and Pike. Nowhere have I found it more abundant than in northern Huntington and southern Center Counties. Data on fifteen nests give: average set, 5 (sometimes 4); average date, May 27 (May 23-June 25).

146. **Setophaga ruticilla.** REDSTART.—Breeds regularly but not commonly in southern New Jersey from Ocean to Cape May Counties and more commonly from Belvidere northward along the Delaware. In Pennsylvania I have found it nesting along the Pennypack Creek near Philadelphia, where however it is rare. In the southeastern and southwestern sections it is rare and local and very scarce in the central parts of the state. In the northeast — Wayne, Monroe and Pike Counties — it is more plentiful but local as it is also in Warren County. Data on nine nests give: average set, 4 (3-5); average date, May 30 (May 24-June 19).

147. **Mimus polyglottos polyglottos.** MOCKINGBIRD.—On May 9, 1914, I saw a Mockingbird near Waynesburg, Greene County, Pa., and was

told by an old collector that they had bred on his farm for several years and that he had found their nests. I have not found them nesting anywhere in Pennsylvania or New Jersey.

148. **Dumetella carolinensis.** CATBIRD.—An abundant summer resident throughout both states, but less numerous in the mountainous counties of Pennsylvania. Data on 110 nests give average set, 4 (3-5); average date, June 1 (May 22-July 10).

149. **Toxostoma rufum.** BROWN THRASHER.—Common in the lower parts of both states but less abundant or rare in the mountainous sections. Data on thirty-two nests give: average set, 4 (3-5); average date, May 12 (May 4-June 21).

150. **Thryothorus ludovicianus ludovicianus.** CAROLINA WREN.—Breeds commonly from Burlington and Camden Counties south to Cape May, New Jersey, and less frequently up the Delaware River to Frenchtown. In Pennsylvania I have found it as a summer resident in the following counties: Chester, Delaware, Philadelphia, Montgomery, Bucks, Lancaster, York, Dauphin, Cumberland, Perry (rare), Greene and Washington. Data on thirteen nests give: average set, 5 (4-6); average date, April 15 (April 5-June 18).

151. **Thryomanes bewicki bewicki.** BEWICK'S WREN.—Breeds fairly commonly in Greene County, Pennsylvania, where I have found several nests. It is also a regular though rare breeding bird in Center County, where at least one pair nests every year. In Huntington County it nests rarely. Two sets of eggs in my collection from Waynesburg, Greene County, were taken on May 6, 1911 (6 eggs), and May 10, 1914 (7 eggs).

152. **Troglodytes aëdon aëdon.** HOUSE WREN.—Common summer resident in southern New Jersey and in Pennsylvania east of the Alleghanies. West of the mountains it seems to be more local and in Greene County is largely replaced by the previous species. Data on forty-seven nests give: average set, 6 or 7 (5-8); average date, May 28 (May 22-July 29).

153. **Nannus hiemalis hiemalis.** WINTER WREN.—I have found this species summering in the following counties: Warren, Clinton, Sullivan, Pike, Monroe and Wayne, but have found more of the sham nests than the occupied ones. Data on three nests give: average set, 4 or 5; average date, May 20.

154. **Cistothorus stellaris.** SHORT-BILLED MARSH WREN.—One of my most interesting New Jersey records is of a colony of these birds nesting on the salt marsh in lower Burlington County. They inhabited the thick marsh grass, not the cattails or higher growth, and nest in the grass close to the ground. Two sets of eggs in my collection were taken August 4, 1913, and consist of four and five eggs respectively. Another nest found on the same day contained five young birds. These were evidently a second nesting. In Pennsylvania I have noted the Short-billed Marsh Wren in Center County as late as May 30 but have no evidence of its nesting.

155. *Telmatodytes palustris palustris*. LONG-BILLED MARSH WREN.—Nests commonly all along the New Jersey coast marshes from Jersey City to Cape May, and along the Delaware River north to Trenton, N. J., and Bucks County, Pa. Data on 196 nests give: average set, 5 (3-7); average date, June 4 (May 26-July 18).

156. *Certhia familiaris americana*. BROWN CREEPER.—I have found this bird in summer in Sullivan and Warren occasionally, but have never found its nest. It has however been taken both in the mountains of Pennsylvania and New Jersey by others.

157. *Sitta carolinensis carolinensis*. WHITE-BREASTED NUTHATCH.—A regular but not common breeder in southern New Jersey and southeastern Pennsylvania and more common throughout the rest of the latter state. Very common in Center County. Data on fourteen nests, all but two from Center Co., give: average set, 7 or 8 (5-9); average date, April 28 (April 22-May 19).

158. *Sitta canadensis*. RED-BREASTED NUTHATCH.—I have met with this bird in summer only uncommonly in Warren and Sullivan Counties, and have not found its nest although they have been found in the latter county by others. In 1917 the birds remained in Pike County until June 9 but none bred.

159. *Baeolophus bicolor*. TUFTED TITMOUSE.—Nests fairly commonly in southern New Jersey and in southeastern and southwestern Pennsylvania within the limits of the Carolinian fauna. I have also found it rarely in summer in the river valleys in Pike and Center Counties. Two nests that I have found are as follows: 1, Philadelphia, Pa., May 25, 1906, six hatching eggs and one young; 2, Tinicum, Delaware County, Pa., May 10, 1907, six eggs.

160. *Penthestes atricapillus atricapillus*. BLACK-CAPPED CHICKADEE.—A regular breeder in the mountainous parts of Pennsylvania from Fayette and Huntington Counties north to Warren and Pike. Data on seven nests give: average set, 7 (5-8); average date, May 10 (May 4-June 10).

161. *Penthestes carolinensis carolinensis*. CAROLINA CHICKADEE.—I have found this species breeding commonly in southern New Jersey from Burlington County south and in Greene County in southwestern Pennsylvania. Data on ten nests give: average set, 7 (5-8); average date, New Jersey (four nests) May 15; Pennsylvania (six nests) May 9.

162. *Regulus satrapa satrapa*. GOLDEN-CROWNED KINGLET.—A rare summer resident of Pike County and rather more common in Monroe but I have never found its nest.

163. *Polioptilla caerulea caerulea*. BLUE-GRAY GNATCATCHER.—I have found this bird to be a very common summer resident of Greene, Washington and Alleghany Counties in southwestern Pennsylvania. Data on thirty-six nests give: average set, 5 (sometimes 4); average date, May 14 (May 7-May 25).

164. *Hylocichla mustelina*. WOOD THRUSH.—Breeds commonly

throughout New Jersey and Pennsylvania but becomes local in the northern mountainous portion of the latter state. Data on eighty-four nests give: average set, 4 (3-5); average date, New Jersey (twelve nests) May 22; southern Pennsylvania (sixty-two nests) May 26; northern Pennsylvania (ten nests), June 2.

165. *Hylocichla fuscescens fuscescens*. VEERY.—I have found the Veery breeding regularly in Sullivan, Wyoming, Pike, Wayne and Monroe Counties, Pennsylvania, while west of the Alleghanies it is much more abundant and I have summer records from the following counties: Bedford, Fayette, Clarion, Blair, Venango, Warren and Erie. I have had no experience in northern New Jersey where it also nests. Data on five nests give: average set 4 (sometimes 3); average date, June 1 (May 26-June 29).

166. *Hylocichla ustulata swainsonii*. OLIVE-BACKED THRUSH.—I have found this thrush summering in Warren, Pike, and Monroe Counties, Pennsylvania. A set of four eggs from the last county taken, June 8, 1910, is in my collection.

167. *Hylocichla guttata pallasii*. HERMIT THRUSH.—I have found the Hermit in summer in Warren, Monroe, Sullivan, Pike and Wayne Counties, Pennsylvania. Data on five nests give: average set, 4 (sometimes 3); average date, June 10 (May 30-June 23).

168. *Planesticus migratorius migratorius*. ROBIN.—Breeds abundantly throughout both states. Data on 346 nests give: average set, 4 (2-5); average date, for first sets April 20 (earliest, April 18); for second sets May 25; third sets July 4. In fixing dates for later sets four pairs were studied which raised three broods annually on porches near my home at State College, for three years in succession.

169. *Sialia sialis sialis*. BLUEBIRD.—Breeds commonly throughout both states, being least abundant in the neighborhood of Philadelphia and in the wilder, northern mountainous section. Data on sixty-nine nests give: average set, 5 (4-6); average date, for first sets, April 15, earliest, April 4; for second sets, June 25, latest, August 2.

THE BIRDS OF WALLA WALLA AND COLUMBIA
COUNTIES, SOUTHEASTERN WASHINGTON.

BY LEE RAYMOND DICE.

(Continued from p. 51.)

Otocoris alpestris arcticola. PALLID HORNED LARK.—S. H. Lyman reports a specimen of this form taken near Walla Walla during the first part of March a few years ago.

Otocoris alpestris merrilli. DUSKY HORNED LARK.—The most abundant bird of the bunch-grass habitat throughout southeastern Washington. In early June, 1914, numbers of adults and nearly grown young were seen on the bunch-grass hills near Wallula and Nine-mile. They were especially numerous on wind swept ridges. In the grain fields and bunch-grass areas of eastern Walla Walla County they are abundant throughout the year. Although they often come very near timber in the valleys, they are never found among trees.

On April 10, 1905, a young Horned Lark, just able to fly, was seen in the hills near Prescott. On April 18 a nest containing a full set of three eggs was found. On April 12, 1906, a nest with three partly feathered birds was seen. This nest was deserted on the 22nd. On March 27, 1908, one nest of three eggs and another with two eggs were found in a stubble-field. All of these nests were composed of dried grasses and weed leaves, and the rim of the nest was flush with the level of the ground. Each nest was in such a position that it was partially concealed by a clump of stubble or of weeds. On April 7, 1908, a young bird fully feathered and able to fly was seen.

Horned Larks often follow the plows and other farm implements to pick up the insects, larvæ, and seeds which are exposed when the ground is stirred up. The Horned Lark is one of the few birds that the advance of agriculture has not reduced in number. Most of the other prairie birds find difficulty in rearing broods, because the spring plowing practiced in the region destroys the nests, but many young of the Horned Lark are able to fly before plowing is well under way.

Pica pica hudsonia. MAGPIE.—A few were seen in early June, 1914 in the willows along the Walla Walla River east of Wallula, and some were observed in the sage-brush about a half-mile from the river. In the prairie area of Walla Walla and Columbia counties they are abundant in the timber along the streams throughout the year. They also wander long distances out into the bunch-grass hills.

Cyanocitta stelleri annectens. BLACK-HEADED JAY.—Reported in winter at Walla Walla (Bendire, 1895, 370). Abundant near Prescott some winters, but they do not appear every year. In late July, 1914, a

number of small flocks were seen in lowland fir forest near Hompeg Falls. On Aug. 3 one was seen in heavy Douglas spruce forest on top of a ridge near Twin Buttes R. S.

***Perisoreus canadensis capitalis*.** ROCKY MOUNTAIN JAY.—S. H. Lyman has observed this jay a number of times in the Blue Mountains at an altitude of 4000 feet or more, and has taken several specimens.

***Corvus corax sinuatus*.** MEXICAN RAVEN.—Reported by Dawson and Bolles (1909, 5-9) from near Wallula and from the Blue Mountains.

***Corvus brachyrhynchos hesperis*.** WESTERN CROW.—A few were seen June 14, 1914 in willows near Wallula. Dawson (1914, 57) reports their presence near Wallula on May 3, 1907. On June 9, 1914, numbers were seen along the Touchet River several miles below Lamar. They are of occasional occurrence in the timber along the Touchet River near Prescott. Fairly large flocks have been seen in late summer and early fall in yellow pine forests, and in lowland fir and deciduous forests in the Blue Mountains.

***Nucifraga columbiana*.** CLARK'S NUTCRACKER.—On July 28, 1914 several were seen in alpine fir forest on a ridge of the Blue Mountains.

***Molothrus ater artemisiæ*.**¹ NEVADA COWBIRD.—On June 16, 1914 a few were noted in the willows along the Walla Walla River near Wallula. A number occur in summer near Prescott. They are most numerous in the timber along the Touchet River and in meadows, but wander a considerable distance into the open fields.

***Xanthocephalus xanthocephalus*.** YELLOW-HEADED BLACKBIRD.—In 1914, several people reported the occurrence of this species about small swamps near Attalia and Wallula. They are also reported to have been seen near Waitsburg and Dayton in company with Red-wings.

***Agelaius phoeniceus neutralis*.** SAN DIEGO RED-WING.—Several were seen near Nine-mile in early June, 1914, about small cat-tail swamps caused by seepage from irrigation ditches. A few are found in summer at the edges of streams in the Touchet Valley near Prescott. They often feed on the meadows or in open brush not far from water.

Bendire reported Red-wings as regular winter residents at Walla Walla (Allen, 1881, 128), but they have not been observed near Prescott in winter. Spring arrival dates at Prescott are: March 8, 1905; April 3, 1906; March 2, 1908; and March 23, 1913.

***Sturnella neglecta*.** WESTERN MEADOWLARK.—Numerous in early June, 1914, on the bunch-grass hills near Wallula and Nine-mile. They occurred also in the sage-brush of the lower country near these places, but were much less numerous than in the bunch-grass. In the prairie area Meadowlarks are common throughout the year. They are characteristically prairie birds and do not go into thick brush, although they sometimes alight in the tops of tall trees or feed on the ground in open timber.

June 24, 1909, a nest with four eggs was found in a meadow two miles

¹ Grinnell, 1909, Univ. Calif. Publ. Zool., Vol. 5, p. 276.

east of Prescott. Another nest containing five eggs was found near the same place on June 5, 1913. In a third nest six blind nestlings were found July 7, 1915. A young bird able to fly was seen on May 9, 1913.

Icterus bullocki. BULLOCK'S ORIOLE.—A few were seen in early June, 1914 in the willows along the Walla Walla River near Wallula, and one was noted in sage-brush a short distance from the river. Near Prescott they are common in summer wherever trees are found. They may also be seen occasionally on fences in the bunch-grass hills a mile or more from timber. At Lyon's Ferry several were seen in late June, 1914, in shade and orchard trees.

Spring arrival dates at Prescott are May 11, 1908; and May 14, 1913. In 1915 they were still numerous on Aug. 8. They nest commonly in the higher trees along the Touchet River. A male accompanied by several fledglings was seen July 10, 1915.

Euphagus cyanocephalus. BREWER'S BLACKBIRD.—Common in early June, 1914 in the willows east of Wallula. These birds commonly fed in the sage-brush within a half mile of the river. They are numerous in summer near Prescott. During the breeding season they are rather closely restricted to the vicinity of brush and swampy places, where they nest, but at other times they wander far out into the bunch-grass hills. They often follow plows or other farm implements to pick up insects.

Bendire (1895, 493) reported them a regular winter resident at Walla Walla, but there is no record of them in winter near Prescott. Spring arrival dates at Prescott are: April 24, 1905; and April 6, 1908. The first arrivals appear in flocks of ten to twenty-five individuals. In 1915 they were still numerous on Aug. 8.

Hesperiphona vespertina brooksi.¹ BRITISH COLUMBIA EVENING GROSBIRD.—Irregularly present in winter in the timber along the Touchet River near Prescott. In the winter of 1904-05 they were numerous in large flocks. In that year they were last noted on April 19. In 1915 they first appeared on Nov. 22. A few were reported at Walla Walla between April 5 and 10, 1885 (Belding, 1890, 130). S. H. Lyman states that they are numerous in summer in the Blue Mountains, and that young birds have been seen in September beside the Touchet River at Dayton.

In winter at Prescott they commonly feed on sumac seeds, and have no difficulty in cracking these hard seeds in their bills.

Acanthis linaria linaria. REDPOLL.—Several specimens at Whitman College were taken by S. H. Lyman in Columbia County.

Astragalinus tristis pallidus. PALE GOLDFINCH.—One was taken June 15, 1914, in sage-brush not far from the Walla Walla River east of Wallula. Near Prescott Goldfinches are common in winter, but are rare in summer. They occur at Walla Walla in winter (Belding, 1890, 136). One was seen at Lyon's Ferry on June 23, 1914. In summer they are

¹ Grinnell, Condor, January, 1917, p. 20.

closely restricted to the neighborhood of trees and brush, but in winter they wander a mile or more out into the bunch-grass.

A male was seen feeding a fledgling near Prescott on July 11, 1910.

Spinus pinus pinus. PINE SISKIN.—In the winter of 1904-05 Pine Siskins were numerous in small flocks in the trees and brush along the Touchet River near Prescott. They fed extensively on the seeds of the alder. None were observed later than March 5. They have been noted in early spring at Walla Walla (Belding, 1890, 139). A specimen from Walla Walla in the Whitman College collection was taken March 28, 1905. During July and August, 1914 several individuals were seen at the edge of the deciduous growth in the bottom of the canyon above Hompeg Falls. Others were seen on the ridges in Douglas spruce forest, in thick brush, and in open alpine fir forest, being most numerous in the latter.

Passer domesticus hostilis.¹ ENGLISH SPARROW.—A small flock was noted at Prescott in February, 1908. This must have been about the date of their first arrival, although they had reached Walla Walla several years previously. They have now begun to spread out into the country, and a few have been noted around farm houses in the Touchet Valley.

Poecetes gramineus confinis. WESTERN VESPER SPARROW.—A specimen in the collection of Whitman College was taken at Walla Walla on April 20, 1904.

Passerculus sandwichensis alaudinus. WESTERN SAVANNAH SPARROW.—Abundant on September 16, 1909, in the bunch-grass and stubble-field hills near Prescott. In 1915 they first appeared on Aug. 28 and were common in the fields until Sept. 28. A few were seen in open timber.

Ammodramus savannarum bimaculatus. WESTERN GRASSHOPPER SPARROW.—Rare in the region near Prescott and not reported from any other part of the state (Dice, 1910, 217). A few were seen in June, 1908; June, 1910; and May, 1914. They were all seen at the edge of a wheat field along the base of a bunch-grass hill bordering the Touchet Valley two miles southeast of Prescott.

Chondestes grammacus strigatus. WESTERN LARK SPARROW.—In June, 1914 a number were seen in the sage-brush near Wallula, being often found a mile or more from any other kind of habitat. On the bunch-grass hills near Wallula and Nine-mile they were abundant. They are reported from Walla Walla (Belding, 1890, 148). Near Prescott they are common in summer in the open parts of the valley. They do not go among trees, although they often reach the edge of brush and are found around barns. A number were seen at Lyon's Ferry in June, 1914.

Zonotrichia leucophrys gambeli. GAMBEL'S SPARROW.—The type locality is Wallula (Nuttall, 1840, 556). During the spring and fall migrations they are common in small flocks in the timber and brush along the Touchet River near Prescott. In 1908 they first appeared on April 5 and were still numerous on April 28. In 1913 they were first noted on April 25

¹ Oberholser, Auk, 1917, p. 329.

and were still present on May 15. In 1915 they first appeared in the fall on Sept. 2, and left before Oct. 10. They were present in 1909 on Sept. 17. Bendire reported them a regular winter resident at Walla Walla (Allen, 1881, 128). A number remained throughout the winter of 1907-08 near Prescott, but in other years none remained in that region. At Walla Walla they are reported a not very common summer resident (Belding, 1890, 151). As they are not known to breed in Washington this statement may be questioned.

Spizella monticola ochracea. WESTERN TREE SPARROW.—Type from Walla Walla (Brewster, 1882, 228). During the winter of 1907-08 a few flocks lived for a time in the brush and trees along the Touchet River near Prescott.

Spizella passerina arizonæ. WESTERN CHIPPING SPARROW.—Abundant in summer along the Touchet River near Prescott. They prefer partially open timber or brush, but wander out into fields a half-mile or more. In the summer of 1914 they were found commonly in all of the forest and brush habitats of the Blue Mountains, from the bottoms of the canyons to the tops of the ridges, but were most numerous in brush and semi-open places on the ridges. Here large flocks of old and young were abundant in early August.

Spring arrival dates at Prescott are: April 25, 1905; May 3, 1908; and April 18, 1913. In 1915 they were last noted on Sept. 24.

They nest commonly in the trees and brush near Prescott. A freshly completed nest was found on May 8, 1908. Young able to fly were seen on June 10, 1908. A nest with nearly fledged young was found July 4, 1910. On June 26, 1914, from another nest four young flew away when approached. On July 6, 1914 an adult was seen feeding a juvenile cowbird.

Spizella breweri. BREWER'S SPARROW.—Several juveniles were shot on the bunch-grass hills southeast of Wallula in early June, 1914. Adults and young were numerous in flocks in the bunch-grass on the hills north of the Walla Walla River at Nine-mile. In late June a number were seen and one specimen collected in the bunch-grass hills near Snake River on the road between Prescott and Lyon's Ferry.

Junco hyemalis shufeldti. SHUFELDT'S JUNCO.—Abundant in winter in the timber along the Touchet River near Prescott. They first appeared in 1915 on Sept. 4, and were abundant by Sept. 11. In 1905 they were not seen later in the spring than May 1. In 1913 they were still present on April 13. In the summer of 1914 they were common everywhere in the Blue Mountains from the bottoms of the canyons to the tops of the ridges, but seemed to be most abundant in buck-brush on the ridges.

Amphispiza nevadensis nevadensis. SAGE SPARROW.—Reported by Snodgrass (1904, 231) to prevail everywhere in the western part of Walla Walla County. In 1914 none were observed near Wallula, but they were numerous in flocks in the bunch-grass and grain fields of the Lower Flat north of Nine-mile. One nearly grown individual was taken June 17.

Melospiza melodia merrilli. MERRILL'S SONG SPARROW.—A number were seen in early June, 1914, in the willows along the Walla Walla River near Wallula. At Prescott they are abundant throughout the year in the timber and brush along the Touchet River. Several flocks of young accompanied by parents were seen in the first week of August, 1914, in the brush along Butte Creek.

A nest found two miles east of Prescott on July 13, 1915, contained two well-feathered young. The nest was placed three feet above the ground in an arbor vitæ (not native) and was loosely woven of weeds and grasses, some of which had been picked green.

Passerella iliaca schistacea. SLATE-COLORED FOX SPARROW.—Rare in summer in the thickest brush along the Touchet River near Prescott. On Aug. 2, 1914, one was seen in low brush in a western larch forest on the top of a ridge near Twin Buttes R. S. Another was seen on August 6 in brush along Butte Creek.

Spring arrival dates at Prescott are: March 11, 1905; April 3, 1906; and April 14, 1908.

Pipilo maculatus curtatus.¹ NEVADA TOWHEE.—A few occur in winter in the brush and timber along the Touchet River near Prescott. Bendire took specimens at Walla Walla (Brewster, 1882, 227).

Zamelodia melanocephala. BLACK-HEADED GROSBEEK.—Several were seen in early June, 1914, in the willows along the Walla Walla River near Wallula. Near Prescott a few spend the summer along the Touchet River. They seem to prefer partially open timber and may often be seen in orchard trees. In 1915 they were last seen on Aug. 25. They breed at Walla Walla (Belding, 1890, 177).

Passerina amoena. LAZULI BUNTING.—A few were seen early in June, 1914, at the edge of the willows along the Walla Walla River near Wallula. They are common in the cottonwoods and willows along the Touchet River at Prescott. At Walla Walla they are a common summer resident (Belding, 1890, 179).

Spring arrival dates at Prescott are May 8, 1908, and April 6, 1913. In 1915 they were last noted on Sept. 13.

Piranga ludoviciana. WESTERN TANAGER.—Rare in summer in the timber along the Touchet River near Prescott. During July and August, 1914, one was seen in yellow pine forest on a low ridge of the Blue Mountains; they were common in lowland fir forest near Hompeg Falls; one was seen in western larch forest nearby; and several were noted in deciduous timber beside Butte Creek.

Spring arrival dates at Prescott are: May 19, 1906; May 24, 1908; and May 14, 1913.

Petrochelidon lunifrons lunifrons. CLIFF SWALLOW.—Nesting in great numbers on the rock cliffs overlooking Snake River at Lyon's Ferry. On June 23, 1914, many of the young at this place were nearly full fledged.

¹Grinnell, Univ. Cal. Publ. Zool., VII, 309-311, 1911.

A few nest in barns and other buildings in the Touchet Valley near Prescott. A number of nests were observed on June 17 in a road tunnel under the railroad tracks near Lamar.

Hirundo erythrogastra. BARN SWALLOW.—One nest was seen on June 9, 1914, in a barn near the Walla Walla River at Nine-mile. A few also nest in barns near Prescott. Reported to be common at Walla Walla in summer (Belding, 1890, 188).

Tachycineta thalassina lepida. NORTHERN VIOLET-GREEN SWALLOW.—In June, 1914, a number were seen near Wallula, flying over sagebrush and over the meadows near the Walla Walla River. One was observed drinking from the river while on the wing. A few feed over meadows in the Touchet Valley near Prescott. In 1908 they first appeared near Prescott on April 2.

Riparia riparia. BANK SWALLOW.—A few occur along the Touchet River at Prescott. A nest hole was noted May 19, 1914, in a soft dirt bank. S. H. Lyman reports their occurrence at Dayton.

Stelgidopteryx serripennis. ROUGH-WINGED SWALLOW.—Numerous in summer over the fields of the valleys near Prescott. They are quite often seen to perch in bushes or trees at the edge of the timber or on fences or telephone lines. One was taken on May 26, 1914. Reported from Walla Walla (Belding, 1890, 194).

Bombycilla garrula. BOHEMIAN WAXWING.—A flock of 150 was seen in the timber near Prescott on Dec. 25, 1908, and a smaller flock noted Feb. 26, 1905. S. H. Lyman reports that they occur commonly at Dayton. Bendire took specimens at Walla Walla (Brewster, 1882, 227).

Bombycilla cedrorum. CEDAR WAXWING.—A small flock was seen in timber near Prescott on April 15, 1908. Several individuals were seen in cherry trees on June 13. Bendire took specimens at Walla Walla (Brewster, 1882, 227). S. H. Lyman reports that they breed in the Blue Mountains.

Lanius borealis. NORTHERN SHRIKE.—Bendire took specimens at Walla Walla (Brewster, 1882, 227). One was seen in a field of the Touchet Valley near Prescott on Nov. 16, 1915. S. H. Lyman states that they are not uncommon in the region in winter.

Lanius ludovicianus excubitorides. WHITE-RUMPED SHRIKE.—Numerous during June, 1914, in the sage-brush east of Wallula. A few lived near farm buildings. Several were seen in the bunch-grass near the tops of the hills north of Nine-mile. They were common in the bunch-grass and grain fields of Eureka Flat.

Vireosylva olivacea. RED-EYED VIREO.—Reported not very rare at Walla Walla (Belding, 1890, 199). Snodgrass (1904, 232) found them along the Touchet River in eastern Walla Walla County. S. H. Lyman reports that they occur in the Blue Mountains.

Vireosylva gilva swainsoni. WESTERN WARBLING VIREO.—Common in summer in the timber along the Touchet River near Prescott. In 1913 the first arrival was noted April 26.

Lanivireo solitarius cassini. CASSIN'S VIREO.—S. H. Lyman reports them to be common in the Blue Mountains in summer. A specimen in the Whitman College collection was taken there Sept. 9, 1900.

Vermivora rubricapilla gutturalis. CALAVERAS WARBLER.—Dawson and Bolles (1909, 176) report the appearance of this species at Wallula on April 23, 1905.

Dendroica aestiva aestiva. EASTERN YELLOW WARBLER.—Several were seen in early June, 1914 in the willows along the Walla Walla River east of Wallula. They are common in summer in the trees and brush along the Touchet River at Prescott. One was seen June 24, 1914, in some locust trees planted beside Snake River at Lyon's Ferry. They are common in summer at Walla Walla (Belding, 1890, 209).

Spring arrival dates at Prescott are: May 19, 1906; May 18, 1908; and May 14, 1913.

Dendroica auduboni auduboni. AUDUBON'S WARBLER.—Common during migration in the trees along the Touchet River at Prescott. In 1913 they were first noted on April 19. In 1915 fall migrants appeared on Sept. 3.

Dendroica townsendi. TOWNSEND'S WARBLER.—A juvenile was seen in an orchard near Prescott on Aug. 8, 1915. A female was collected on July 23, 1914, from some bushes in the canyon near Hompeg Falls.

Seiurus noveboracensis notabilis. GRINNELL'S WATER-THRUSH.—One was seen Sept. 11, 1915, in some shrubbery near the Touchet River two miles east of Prescott. The bird was seen at close range and carefully studied.

Oporornis tolmiei. MACGILLIVRAY'S WARBLER.—Numerous in summer in the timber along the Touchet River at Prescott. They feed mostly on the ground or in very low bushes, but the males go higher to sing. A female was taken Aug. 7, 1914, in thick brush beside Butte Creek in the Blue Mountains. They were present at Prescott as late as Sept. 3 in 1905, and in 1915 one was seen Sept. 9.

Geothlypis trichas occidentalis. WESTERN YELLOW-THROAT.—Occasional in summer in thick brush along the Touchet River at Prescott. Reported common in summer at Walla Walla (Belding, 1890, 218). In 1906 males first appeared at Prescott on May 13.

Icteria virens longicauda. LONG-TAILED CHAT.—Several were seen in the willows along the Walla Walla River near Wallula on June 16, 1914. Near Prescott a number spend the summer in the timber along the Touchet River. They are reported from Walla Walla (Belding, 1890, 265).

Wilsonia pusilla pileolata. PILEOLATED WARBLER.—A few were seen May 18, 1913, in trees along the Touchet River east of Prescott. In 1915 fall migrants appeared Aug. 22, and were common until Sept. 13.

Setophaga ruticilla. REDSTART.—Several were seen during June, 1908 in the timber along the Touchet River two miles east of Prescott. A nest was begun in a pear tree by a female about June 15 and was later

finished, but no eggs were ever laid in it. Bendire shot an adult male near Walla Walla (Brewer, 1880, 50).

Anthus rubescens. PIPIT.—Abundant in flocks on the prairie hills near Prescott during migrations. Reported at Walla Walla (Belding, 1890, 265). A spring record at Prescott is April 29, 1908. In 1909 they were noted on Sept. 16. In 1915 they were first noted on Sept. 25 and were present until Nov. 7.

Cinclus mexicanus unicolor. DIPPER.—Numerous along the streams in the Blue Mountains. In the last week of July, 1914, a number were observed on the North Fork of the Touchet River near Hompeg Falls, and in the first week of August many were seen along Butte Creek.

Dumetella carolinensis. CATBIRD.—Several were seen in early June, 1914 in the willows along the Walla Walla River east of Wallula. They are common in summer in the thick brush along the Touchet River near Prescott, and are sometimes found in orchards. Reported rare at Walla Walla in 1885 (Belding, 1890, 226).

Spring arrival dates at Prescott are: May 31, 1908; and May 24, 1914. In 1915 they were still present on Aug. 31.

Salpinctes obsoletus obsoletus. ROCK WREN.—Numerous in early June, 1914, on a rocky hillside southeast of Wallula. Several, including a fledgling just able to fly, were seen June 16 in a little ravine in the bunch-grass of a nearby hillside. In late June, 1914, they were numerous about the rock cliffs and slopes near Lyon's Ferry, and a few were seen in the adjacent bunch-grass. On Sept. 16, 1909, one was collected from a fence on a hill southeast of Prescott. In late July, 1914, several were seen about rock exposures on the sides of the canyon near Hompeg Falls.

Troglodytes aëdon parkmani. WESTERN HOUSE WREN.—A number spend the summer in the timber along the Touchet River near Prescott. Spring arrival dates are: May 3, 1905; April 9, 1909; and April 21, 1913. In 1915 they were last noted on Aug. 25.

Nests were found May 13, 1906, and June 18, 1913, both in holes in decaying limbs of cherry trees. Another nest on a sill in a farm building held six naked young on July 1, 1915.

Nannus hiemalis pacificus. WESTERN WINTER WREN.—Common during late July, 1914, in the lowland fir forest at Hompeg Falls. One was seen on July 29 in damp Douglas spruce forest near the top of the ridge at Twin Buttes R. S. In 1915 migrants appeared near Prescott on Sept. 8, and the species was last seen on Oct. 13.

Telmatodytes palustris plesius. WESTERN MARSH WREN.—Reported from Walla Walla by Oberholser (1897, 189). One was seen Aug. 5, 1914, in the brush at the edge of a small beaver-dam swamp beside Butte Creek.

Certhia familiaris montana. ROCKY MOUNTAIN CREEPER.—A number were present during December, 1908 in the trees along the Touchet River east of Prescott. In the winter of 1915 they first appeared on Dec. 11. A female and a flock of young were seen July 26, 1914, in lowland fir

timber near Hompeg Falls. The female had the tail feathers worn down to stubs not over three-fourths of an inch in length.

Sitta carolinensis aculeata. SLENDER-BILLED NUTHATCH.—One was seen Aug. 7, 1913, in a cherry orchard east of Prescott. A specimen from the Blue Mountains is in the Whitman College collection.

Sitta canadensis. RED-BREASTED NUTHATCH.—Occasional, except perhaps in summer, in the timber along the Touchet River near Prescott. In 1908 they were still at Prescott on June 20, and in 1915 the first was seen Sept. 5. In late July and early August, 1914, numbers were noted on the ridges of the Blue Mountains. They were numerous in western larch and in Douglas spruce, and one was seen in alpine fir forest.

Sitta pygmæa pygmæa. PYGMY NUTHATCH.—Reported common in the forests of the Blue Mountains in Columbia County by S. H. Lyman, who has examined two or three nests.

Penthestes atricapillus septentrionalis. LONG-TAILED CHICKADEE.—Several were seen in the willows along the Walla Walla River east of Wallula in early June, 1914. At Prescott they are a common resident in the timber along the Touchet River. In late July, 1914, they were common in lowland fir forest near Hompeg Falls. One flock was seen on Aug. 5 in the brush beside Butte Creek.

Nests in process of construction have been found near Prescott on April 7, 1906; April 9, 1906; April 9, 1913; and April 10, 1913. In each case the nest was excavated in the decayed wood of orchard or shade trees. In early June, 1908 several flocks of nearly fledged young accompanied by both parents were seen.

The process of nest excavation was watched for a short time on April 10, 1914. This nest was being excavated in the rotten heart of a pear tree, and entrance was obtained through the end of a stub about four feet from the ground. The male and female took part equally in the work, and the labors were continued throughout the day. A vigorous pecking could be heard while either bird was at work. The excavated material was carried in the bill a distance of ten yards or more from the nest before being dropped. It was not dropped in the same place each time, but was scattered over a wide area. Usually the birds alighted on some branch before dropping the debris, but sometimes it was dropped while the bird was flying. As soon as one bird left the hole the other entered immediately. Sometimes the bird outside had to wait a short time. Between 12 M. and 1 P. M. the average time each bird spent in the nest hole was thirty seconds and the shortest time four seconds.

Penthestes gambeli gambeli. MOUNTAIN CHICKADEE.—In the winter of 1905-06 several flocks lived in the trees along the Touchet River east of Prescott. They did not associate with the long-tailed chickadees, but the two species fought when they met. In the summer of 1914 several were seen on the high ridges of the Blue Mountains in alpine fir forest, in western larch forest, and in Douglas spruce forest. Some were seen in yellow pine and in Douglas spruce forests on the low ridges near Hompeg Falls, but none were observed in the canyons.

Penthestes rufescens rufescens. CHESTNUT-BACKED CHICKADEE.—During the winter of 1905–06 several were seen in the timber along the Touchet River east of Prescott. Often they were associated with flocks of long-tailed chickadees. On July 23, 1914, one was seen with a flock of Long-tailed Chickadees in lowland fir forest near Hompeg Falls.

Regulus satrapa olivaceus. WESTERN GOLDEN-CROWNED KINGLET.—Numerous in the fall at Prescott, arriving on Sept. 13, in 1905, and on Sept. 9 in 1915. In 1906 a flock was seen on Dec. 26. In late July, 1914, flocks of young accompanied by parents were numerous in lowland fir forest near Hompeg Falls, and a few were seen in Douglas spruce forest on the mountain slopes. Others were observed in alpine fir forest on the higher ridges.

Regulus calendula calendula. RUBY-CROWNED KINGLET.—Numerous in winter in the timber along the Touchet River at Prescott. Individuals are often associated with flocks of long-tailed chickadees. In 1908 they were still present on April 12. In 1913 they were numerous and in song on April 18. In 1915 the first fall arrival appeared Sept. 6.

Myadestes townsendi. TOWNSEND'S SOLITAIRE.—A number remained throughout the winters of 1904–05 and 1905–06 in the timber along the Touchet River east of Prescott. In 1905 they were last seen on April 5. At the edge of Douglas spruce forest on a low slope near Hompeg Falls several were seen on July 23, 1914. One of these was carrying food in its bill. One was seen in open alpine fir forest on the ridge near Twin Buttes R. S. on July 31.

Hylocichla ustulata swainsoni. OLIVE-BACKED THRUSH.—Reported from Walla Walla (Belding, 1890, 253). Noted in lowland fir forest near Hompeg Falls in late July, 1914.

Hylocichla guttata subsp. HERMIT THRUSH.—Reported common in summer at Walla Walla (Belding, 1890, 254). S. H. Lyman reports them quite common in the Blue Mountains. One was seen among shrubs near the Touchet River east of Prescott on Sept. 11, 1915.

Planesticus migratorius propinquus. WESTERN ROBIN.—In early June, 1914, a number were seen in the willows along the Walla Walla River east of Wallula. In the prairie area of Walla Walla and Columbia counties they are abundant in summer in the meadows and timber along the streams. They range a mile or more out into the bunch-grass hills and often are found in trees about isolated farm houses. A few remain throughout the winter. During the breeding season they may often be seen at the edge of the river securing mud to plaster their nests. In the late summer of 1914 a few were seen in yellow pine forest near Hompeg Falls and in the same kind of forest on a low ridge near the Oregon line. On the ridge near Twin Buttes R. S. they were seen in western larch forest. On Butte Creek they were numerous in the deciduous timber. One was seen in a small opening in the lowland fir forest near Hompeg Falls.

The main migration appeared at Prescott in 1905 during the last week of February. In 1915 they had nearly all left before Sept. 1. In 1906 a blizzard began on March 10, when the early spring migration was in full

swing, and on March 15 the temperature reached as low as -1° F. at Prescott. With the ground partly covered by snow, thousands died before the weather moderated.

A nest found on April 23, 1906, two miles east of Prescott in an apple tree, contained one egg. On April 27 there were three eggs and later another was added. On May 3 one of the eggs was missing and the nest contained the headless body of a White-footed Mouse (*Peromyscus maniculatus gambelii*), which the robin was brooding with the eggs. On May 6 all the eggs were gone and the nest deserted. Another nest was found on April 28, 1906, and still another on May 13. On May 2, 1908, a freshly completed nest was found 20 feet high in a locust tree. One egg was laid between 8:30 and 9:15 A. M. on May 4. Another egg was laid between 9:30 and 10:30 A. M. on May 5. The female was disturbed while on the nest late on this evening and the nest was abandoned. On May 8, 1908, three nests, all in the last stages of construction, were found. Half-fledged and nearly-fledged young were abundant in early June, 1908. On April 9, 1913, a nest nearly completed was found. In 1915 a nest containing fully-fledged young was seen June 30. On May 18, 1908, a nest containing one egg was found on a post in a barn in the hills southwest of Prescott. On May 28 it contained four eggs. This nest was constructed of string, horse hair, and straw, but, probably owing to the scarcity of water, very little mud was used to plaster the nest.

Ixoreus naevius naevius. VARIED THRUSH.—During the blizzard of early March, 1906, great numbers appeared near Prescott and many were killed. One was seen on April 1, 1913, and another on April 20 in the trees along the Touchet River. In 1915 they were noted rarely from Nov. 7 to Dec. 3. S. H. Lyman has seen them in the Blue Mountains in the fall and says they often appear in winter at Dayton.

Sialia mexicana occidentalis. WESTERN BLUEBIRD.—Reported at Walla Walla (Belding, 1890, 262). From Nov. 13 to 15, 1915, a small flock was observed in an open field of the Touchet Valley and at the edge of timber near Prescott. On July 23, 1914, several were seen in yellow pine forest near Hompeg Falls.

Sialia currucoides. MOUNTAIN BLUEBIRD.—Dawson and Bolles (1909, 260) give a breeding record for Wallula. One was seen June 18, 1914, on a telephone post in the prairie near Eureka. They occur sparingly in summer in the bunch-grass hills in the neighborhood of Prescott, and some are reported to breed in the town. In late July and early August, 1914 mountains were seen in open alpine fir forest on high ridges of the Blue Mountains, and a few were seen in yellow pines on a lower ridge.

Spring arrival dates near Prescott are March 14, 1905 and March 4, 1908.

BIBLIOGRAPHY.

ALLEN, J. A.

1881. Winter birds of Fort Walla Walla, W. T. Bull. Nutt. Orn. Club, **6**, 128.

BELDING, LYMAN.

1890. Land birds of the Pacific district. Occas. Papers Calif. Acad. Sci., **2**, 274 pp.

BENDIRE, C. E.

1888. Notes on the habits, nests, and eggs of the genus *Sphyrapicus* Baird. Auk, **5**, 225-240.
1888a. Notes on the habits, nests, and eggs of the genus *Glaucidium* Boie. Auk, **5**, 366-372.
1892. Life-histories of North American birds, with special reference to their breeding habits and eggs. Smithsonian Contrib. Knowl., **28**, x + 446 pp., 12 col. pls.
1895. Ibid. From the parrots to the grackles. Smithsonian Contrib. Knowl., **32**, x + 518 pp., 7 col. pls.

BREWER, T. M.

1880. The Redstart in Washington Territory. Bull. Nutt. Orn. Club, **5**, p. 50.

BREWSTER, W.

1882. Notes on some birds collected by Capt. Charles Bendire at Fort Walla Walla, Washington Territory. Bull. Nutt. Orn. Club, **7**, 225-233.

DAWSON, W. L.

1908. New and unpublished records from Washington. Auk, **25**, 482-485.
1914. An Asionine ruse. Condor, **16**, 56-57.

DAWSON, W. L., AND BOWLES, J. H.

1909. The birds of Washington. (Occidental Publ. Co., Seattle) 2 vol., xiv + 997 pp., numerous unnumbered pls. and figs.

DICE, LEE R.

1910. New records for the State of Washington. Auk, **27**, 217-218.
1915. First specimens of Baird Sandpiper from the State of Washington. Condor, **17**, 60.
1916. Distribution of the land vertebrates of southeastern Washington. Univ. Calif. Publ. Zoöl., **16**, 293-348, pls. 24-26, 2 figs.

NUTTALL, THOMAS.

1840. Manual of the ornithology of the United States and Canada. The land birds. Ed. 2, with additions, (Hilliard, Boston), viii + 832 pp., 54 figs.

OBERHOLSER, H. C.

1897. Critical remarks on *Cistothorus palustris* (Wils.) and its western allies. Auk, **14**, 186-196.

1904. A revision of the American Great Horned Owls. Proc. U. S. Natl. Mus., **27**, 177-192.

RIDGWAY, R.

1914. The birds of North and Middle America. U. S. Natl. Mus., Bull., **50**, part 6, xx + 882 pp., 36 pls.

SNODGRASS, ROBERT E.

1904. A list of land birds from central and southeastern Washington. Auk, **21**, 223-233.

TOWNSEND, J. K.

1839. Narrative of a journey across the Rocky Mountains to the Columbia River, and a visit to the Sandwich Islands, Chili, etc.; with a scientific appendix. (H. Perkins, Philadelphia), viii (9) 352 pp.

A STUDY OF THE YELLOW-BILLED CUCKOO.

BY CLARA KERN BAYLISS.

On July 24, 1916, I found a Yellow-billed Cuckoo's nest, with the bird incubating, ten feet from the ground on the horizontal branch of a small elm. Not having my "periscope" (an adjustable mirror at the top of a bamboo pole) with me, I assisted a little girl who had accompanied me, to climb the tree; and she reported that the nest contained three green eggs, one of them smaller and darker than the other two. As seen through the mirror next day I should describe the smaller as bluish-green and the others as greenish-blue.

July 29, at 6.30 P. M. the eggs were there as usual and the bird remained on the nest until I was almost under her, giving me an opportunity to note her yellow bill and her graceful, horizontal flight as she slipped noiselessly into another tree. The following day was Sunday and was exceedingly hot as was Monday forenoon. In the afternoon of Monday, July 31, there was a severe storm and the nest was not visited until the forenoon of Aug. 1, when there were three young birds in it, all black as ink, the two larger with black hairs (or quill cases) and the smaller with white

ones, on the body. A camera was strapped to the trunk of the tree and a photograph taken which shows the white "hairs" of the one.

The birds were certainly one day old and may have hatched on July 30. When jarred, they made a faint hissing or buzzing like that of a bee. Thinking the little white-haired birdling might be crowded off the frail platform, I took one of the larger birds home with me; and of that I shall speak later.

Toward evening Aug. 4, they were still there though the white-haired one was crowded to the edge of the nest with the big one lying partly upon him. At sundown Aug. 6, only the black-haired one was there, no trace of the other being discernible.

The remaining one was now larger and farther developed than his mate in my home and by this time had a few white quills on his back. He moved about uneasily and seemed to have his eyes open, but of that I could not be sure, looking through the mirror. He pushed himself to the edge and voided excreta upon the weeds below the tree where, contrary to the observations of Jean Stratton Porter, there were seven or eight droppings.

On the evening of Aug. 8 the nest was empty. The old bird was near, but manifested less rather than more of her customary anxiety, if so calm and dignified a bird can be said ever to exhibit anxiety. She called no more than usual and gradually worked her way farther from the tree instead of remaining near to watch my movements. It scarcely seemed probable that the young one could have been able to leave the nest even if, after the way of his species, his feathers had burst into bloom all in one day. He was eight and a half, and may have been nine and a half days old, and it is barely possible that he may have departed without protest and without tragedy. Among the sticks of the shallow platform which had served him for a cradle were bits of the shell that had encased him, now faded almost to robin's-egg blue. The voice of the parent was heard in the vicinity for three or four weeks longer.

The bird I took home to study was as ugly a specimen as could well be; black from tip to toe except the dark wine-colored under mandible and edges of the upper one; big bodied; stupid in the morning and voracious in the afternoon; voiding instantly after swallowing; making that faint hissing and a little *quirt, quirt*;

sleeping with head laid flat before him like an alligator, and occasionally moving it from side to side in serpent-like manner;—utterly ugly except his mouth which when wide open, was cup-shaped and red, with cream-colored knobs in it, making it look like a red flower with sessile yellowish stamens. The legs were black, the toes were black, two of them standing forward, two back, like the toes of a woodpecker. The wings were little flat, crooked sticks such as might be sawed out of a black shingle; and he let them hang down like legs, even using them to prop himself up, and two or three times fairly standing on “all fours.” When he ate he sat up as straight as a Penguin, resting on the back part of his body, tarsi flat out in front of him and toes clutching the flannel cloth in the bottom of his box, to balance himself. When he raised his head there was a perpendicular line from the tip of his bill down the under part of his body to the box in which he sat.

After three days he began to fold his wings to his sides and now and then to stretch and finally to flap them. The hissing gradually merged toward the hungry cry of young birds when being fed. The ciliae on the edges of his wings and tail became bristles and then tiny white-tipped feather-cases; and from his chin down each side of his bare under body, curving upward to the tail, came three or four overlapping rows of minute white quills or feather cases, making him look when sitting up as if he had on a cut-away coat. These began to show Aug. 3, when he was four, possibly five days old. He uttered his little *quirt* and the buzzing sound without opening his mouth. The former he ceased to make on Aug. 4 and 5, but the latter became louder and was uttered when he ate and whenever his box was touched, whether he raised his head or not.

He lacked regurgitated food and brooding, and every morning was so dumpish that he seemed about to die. But toward night he became as lively and as hungry as ever. Yet he was not thriving as well as the one in the nest and it was my intention to exchange the two;—but he circumvented me.

At first he was fed on large caterpillars from a laurel oak; later on berries and the larvæ from cabbages. He did not seem to relish water or the white of egg and worked his bill and his black tipped tongue as if trying to spit it out. Flies were his specialty, so I secured a quantity that had been scalded and emptied out of a trap.

They were dry and hard, but after wetting them I gave him all he wanted, which was as much as a large tablespoonful. That was unwise, but he was voracious. Next morning, Aug. 6, he was only slightly more inert than usual, but could scarcely swallow a cabbage worm. When given a little juice from blackberries, much to my surprise, he lay over on his side, and died.— And he had never opened his eyes on the troubles of this world.

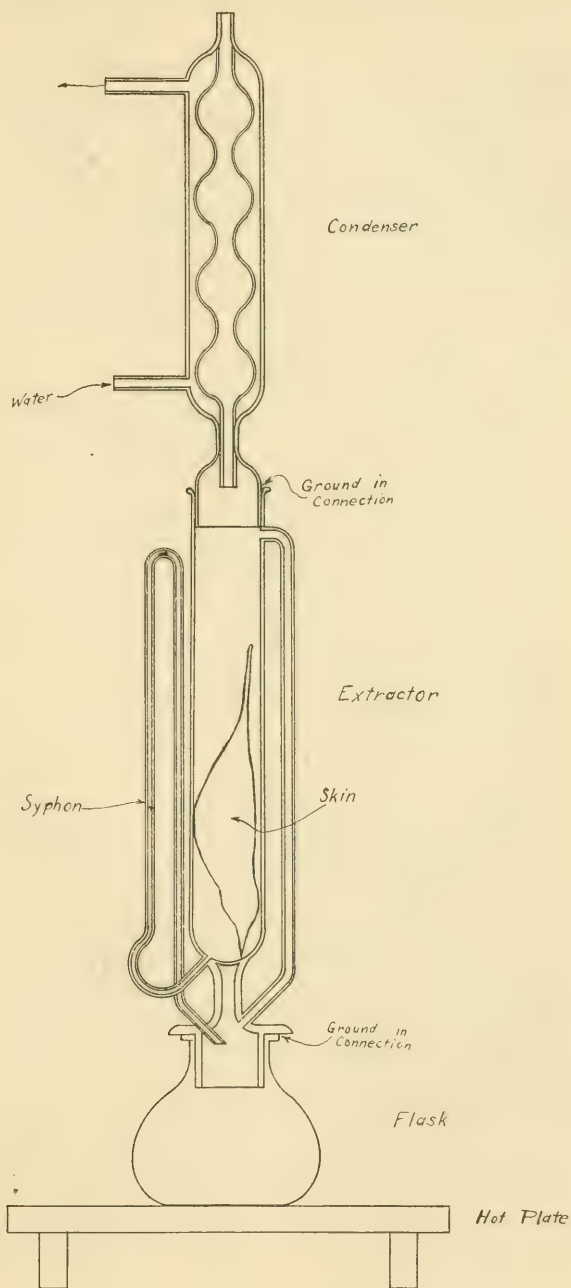
THE EXTRACTION OF FAT FROM BIRD-SKINS.

BY HOYES LLOYD.

MANY valuable bird-skins are rapidly deteriorating, and this work was undertaken with a view to discover a simple method to stop the decomposition of existing specimens and to enable us to prepare specimens which will not decompose from the same causes, in the years to come. If this method succeeds in preventing the imminent total destruction of type specimens and specimens of extinct species, as well as many others of value to the ornithologist I shall be amply rewarded.

The decay of bird-skins is due, apparently, to the presence of fat. This fat gradually spreads over the entire specimen and even saturates the label, in time making it illegible. The fat itself discolors the specimen and every particle of dust with which the specimen comes in contact adheres to the fat, thus increasing the discoloration. Finally, we have a dirty, greasy bird-skin; the feathers are matted and adhere to each other in groups and the specimen does not resemble the living bird in the slightest degree. Then the fat decomposes, perhaps very slowly, and the fatty acids produced slowly attack the skin itself and gradually it falls to pieces and is utterly destroyed.

Washing or wiping the specimen with solvents for fats is only a



subterfuge and, as all the fat is not removed, the decomposition still continues.

The method which I have found successful consists in washing, soaking and extracting the specimen with automatically repeated doses of the freshly distilled fat solvent. It is an adaptation of the Soxhlet extraction apparatus of the chemist. By this method the entire bird-skin, including the skin, feathers, beak, feet and label, is rendered chemically free from fat, the decomposition due to fat is checked completely, and the future existence of the specimen is probably assured.

The apparatus used is shown in the figure. The one represented is made of glass connected by ground in joints. Cold water is supplied to the invert condenser and heat is supplied to the flask of solvent by an electric light bulb or by an electric hot plate provided with a rheostat so that the temperature can be adjusted. Do not use a flame to heat the flask, as the solvent, ethyl-ether, $(C_2H_5)_2O$ is inflammable and explosive when mixed with air; it boils at $35^{\circ}C$.

The specimen to be cleaned is placed in the extraction chamber, the apparatus is closed, enough ether is poured in the opening in the top of the condenser to charge the syphon twice, and the opening covered with a funnel or loose cap. It must not be closed tight. Then the water is turned into the condenser and the current for the heating apparatus is turned on. Sufficient heat is being supplied when the liquid boils gently.

The ether vapor goes around by way of the by-pass into the condenser, is condensed and falls on the specimen. When the extraction chamber is full of solvent, the first extracting charge syphons automatically into the flask below and carries with it all the fat which it has dissolved. As the operation continues, the specimen is repeatedly washed with freshly distilled ether until not a vestige of fat remains. Two or three hours should complete the operation, but the apparatus can safely be left in operation all night, if it is carefully set up and if the heating apparatus is correctly adjusted.

The operation is completed when the solvent, after passing over the specimen, remains perfectly colorless.

Before opening the apparatus, turn off the heating unit and allow the ether to cool thoroughly. This can be hastened by immersing

the bottom flask in water or in ice water. The ventilation of the room should be good, as the inhaling of ether produces headache and, finally, anesthesia. Remove the specimen and place it on clean absorbent cotton. Dry with a gentle blast of clean air, or in a current of clean air. The feathers can be adjusted during drying. Any dirt which had adhered to the fat will blow away as dust. Cornmeal, used as an absorbent in the preparation of skins which were later cleaned by this method, fell out of the plumage like sand, or was carried off by the air blast.

This apparatus can be made of copper, if a large number of skins are to be cleaned, and it can then be of considerable size and the extraction chamber packed with specimens. If made of copper, the top of the extraction chamber and condenser should be removable. The joint where the cover with condenser attached joins the extraction chamber must be gas-tight. In the copper apparatus there should be a pipe provided with a stop-cock connecting the bottom of the extraction chamber with the distillation flask. The stop-cock should be closed during the extracting, but can be opened to drain the ether from the extraction chamber before the chamber is opened. In using a metal apparatus, the length of time required for complete extraction of the fat will have to be judged by experience. In the glass apparatus, the color of the solvent in the extraction chamber indicates when the extraction is complete.

All skins must be dry before being subjected to this process. If it is necessary to relax a skin before extracting, dry it temporarily in a shape to fit the extractor, extract it, relax after ether has evaporated and set again.

Newly made skins known to be greasy can be treated as soon as dry. The ether does not relax the skin in the slightest degree. Some arsenic may be washed from the skin by mechanical action, but sufficient will be left to render the bird-skin safe from insect attacks.

The use of such other solvents as petroleum ether, gasoline and carbon tetrachloride for extracting fat can be experimented with to advantage, using this apparatus.

The author has used this method on the following specimens, with the result recorded. After treatment, the specimens were

compared with duplicates and the color of the plumage was normal in each case.

Aegialitis semipalmata. Semipalmated Plover, Toronto, Canada, 1905.

Condition. Greasy and dirty, the feathers stuck together with fat; discolored, dusty.

Result. Entire plumage clean, feathers beneath, fluffy and white.

Charadrius dubius dubius. Philippines, 1909.

Condition. Mouldy, greasy and stained with blood.

Result. Entire plumage clean, breast feathers which were exposed to air still rusty, ones covered by wings perfectly white.

Limonites ruficollis. Japan, 1895.

Condition. Dirty, breast greasy and yellow.

Result. Entire plumage clean and fluffy breast almost free from yellow.

Pelidna alpina. Scotland, 1873.

Condition. Practically in the last stages of fatty decomposition; feathers hard.

Result. Clean and free from grease, feathers soft.

In order to determine whether or not this solvent had any de-colorizing effect, a series of experiments was made. A number of hummingbird skins were immersed in ether for one and one-half hours, dried and compared with duplicates; a number of feathers were taken from bird skins, immersed in ether for one and one-half hours, and compared with feathers from the same area on the bird-skin from which they were taken; and a number of larger feathers were cut in two, one half immersed in ether for one and one-half hours and compared with the untreated portion of the same feather. The tests were made with a view to variety in color. The results are summarized below.

EFFECT OF IMMERSION IN ETHER ON FEATHER PIGMENTS.

SPECIES	PORTION	COLOR	EFFECT
<i>Chrysolampis mosquitus</i>	Whole	Iridescent red and gold	None
<i>Selasphorus alleni</i>	"	Iridescent scarlet orange	"
<i>Selasphorus rufus</i>	"	Iridescent scarlet orange	"
<i>Petasophora cyanota cabanidis</i>	"	Metallic green and metallic blue	"
<i>Munia maja</i>	"	Various browns	"
<i>Piranga erythromelas</i> ♂	Back feathers	Scarlet	"
<i>Piranga erythromelas</i> ♀	Side of breast feathers	Yellow	"
<i>Melopsittacus undulatus</i>	Upper tail covert feathers	Green	"
<i>Dendroica fusca</i>	Breast feathers	Orange	"
<i>Chlorophanes spiza exsul</i>	Back feathers	Metallic blue green	"
<i>Sporophila corvina</i>	Secondary	Jet black	"
<i>Setophaga ruticilla</i>	Side of breast feathers	Orange salmon	"
<i>Phoenicurus phoenicurus</i>	Rump feathers	Rufous brown	"
<i>Tanagra cana</i>	Half primary	Blue edging	"
<i>Stoparola melanops</i>	Half secondary	Blue	"

CONCLUSION.

The method given will absolutely remove fat from bird-skins. Damage caused by decomposition which has already occurred cannot be remedied, but an application of this method will stop all further decomposition due to fat. By removing dirt adhering to the grease, the true colors of the plumage can be seen and studied.

Valuable specimens, type specimens and specimens of extinct species can be protected by this process and will have their existence assured for a much greater period of time.

My sincere thanks are due to Mr. J. H. Fleming for providing specimens for the work and for deciding whether or not color changes occurred as a result of the action of the solvent.

THE EVENING GROSBEEK (*HESPERIPHONA VESPERTINA*) IN MAINE, WITH REMARKS ON ITS DISTRIBUTION.

BY ARTHUR H. NORTON.

LIKE the other states east of New York, Maine, so far as known, was first visited by the Evening Grosbeak during the well chronicled flight of 1889-90,¹ when between the dates of Jan. 10 and March 18, 1890 six specimens were detected according to the following records: A male was seen at Orono, Feb. 28, 1890;² two were seen at Bangor, one a female having been taken, March 18, 1890.³ One was taken by S. L. Crosby "near Bangor" in the spring of 1890;⁴ a male was taken at Bates College campus, Lewiston, Jan. 10, 1890;⁵ and a specimen was taken at Fryeburg, without data being preserved.⁶

During the next nineteen years no report appears for this state, though the birds were detected east of New York in very small numbers on several occasions, as Massachusetts during the season of 1903-04,⁷ and in Connecticut in 1905 and 1907.⁸

In the late winter or early spring of 1909 an adult male was taken in the Woodfords section of Portland.⁹

Since that time its occurrence in Maine has been frequent and during the winters of 1915-1916 and 1916-1917, it was actually abundant, and widely distributed.

On November 10, 1910 Miss Adeline Willis saw three in Bridgton.¹⁰

¹ See especially Auk, 1890, Vol. VII. Forest and Stream, 1890, Vol. XXXIV. Ornithologist and Oölogist, 1890, Vol. XV. Also Butler, Auk, 1892, IX: 238-247, and Proc. Canadian Inst. 1890-91, iii, pp. 76-89.

² 1890: Fernald, Orn. & OöL. XV: 46.

³ 1890: Shepherd, OöL. VII: 86.

⁴ 1890: Call, OöL. VII: 252.

⁵ 1891: Walter, Birds of Androscoggin Co., 14.

⁶ 1897: Knight, Bull. 3, U. of M., 89. Knight also reported, one, p. 90, "Seen by S. L. Crosby" which was taken at Brewer, but with the probability that it is the same bird recorded by Call 1890, I have not treated it as a separate record.

⁷ 1904: Nichols, Auk, XXI: 81, and Brown, Ibid., 385.

⁸ 1905: Hutchins, Bird Lore VII: 173, 174. 1907: Bruen, Wils. Bull. XIX: 162.

⁹ 1909: Rich, Journ. Me. Orn. Soc. XI: 26.

¹⁰ 1911: Willis, Bird-Lore, XIII: 93. Unfortunately this record was editorially anticipated, Bird-Lore, XIII: 48, and given as Naples.

In 1912-13 another flight to the northeastern states was noticed and though not a large one, the following Maine reports came to hand:—A flock at Machias in November, 1912, was seen by Mr. John Powers and positively identified, and some numbers were observed elsewhere in Washington, and in Aroostook Counties that winter.¹ The same season Miss Harriette Abbott recorded a flock of twenty at Fairfield (in the Kennebec Valley), March 2 which remained about three weeks.² On March 22, 1913, Mrs. Wm. I. Hacker saw three females in a Rowan tree by her window in the Deering Center section of Portland. On the same date and for several succeeding days, on the grounds of the Swedenborgian church in Bath, Miss Nellie F. Dunton reports several as having been seen. On March 29, 1913 Mrs. F. M. Ray observed an adult male and four dull colored companions in Saccarappa Cemetery, Westbrook, and on April 1 she found eleven there, two of which were adult males. A few hours later with her guidance, I saw nine at the same place, one being an adult male. Mrs. Ray kept a careful watch but saw no more until April 3 when the birds made their last appearance there for the season.

The following season, 1913-14, Mr. Freelan Howe reported fourteen at South Paris, late in December,³ while Mr. Nathan C. Brown observed and recorded seven at Western Cemetery, Portland, on April 16, 1914.⁴

The season of 1915-1916 was remarkable for the great migration of Evening Grosbeaks, extending from Minnesota⁵ to St. Stephen, New Brunswick,⁶ and from Montreal⁷ to Pennsylvania.⁸

The reports from New York and the New England states, for this winter published in 'The Auk' and 'Bird-Lore' are too numerous to mention in this connection. Throughout Maine, where reports could be obtained, the birds were observed in various numbers, showing that very large numbers visited the State. The following extracts from letters will show something of the extent

¹ W. L. Powers in letter.

² 1913: Abbott, *Bird-Lore*, XV: 309.

³ 1914: Howe, *Bird-Lore*, XVI: 27.

⁴ 1915: Brown, *Auk*, XXXII: 102.

⁵ 1916: Roberts, *Occ. Papers Geol. & N. H. Surv. Minn.*, Zool. Div. No. 1.

⁶ 1916: Burnett, *Bird-Lore*, XVIII: 180.

⁷ 1916: Gammell, *Can. Rec. Sci.* IX: 483-488.

⁸ 1916: Gage, *Auk*, XXXIII: 325.

of this migration, and of the numbers of birds observed at different places in the State.

AROOSTOOK COUNTY.—Mr. L. W. Robbins writing from Houlton, April 4, 1916, states: "About three weeks ago I saw a flock of six, two in mature plumage. There is not the slightest doubt of their presence in large numbers in this part of the state this winter."

WASHINGTON COUNTY.—Mr. Clarence H. Clark of Lubec, wrote:—"January first to April first, several small flocks visited Eastern Maine and were seen at Millbridge, Steuben, Machias, Calais and Lubec." Prof. Wm. L. Powers principal of the Washington (County) Normal School, wrote on April 10:—"We have had a large flock of Evening Grosbeaks here in Machias since February: the largest number reported to me by any one person is seventeen seen at one time."

HANCOCK COUNTY.—In the same letter Prof. Powers stated that one had been reported to him from Sullivan.

On March 19, 1916 Miss Cordelia J. Stanwood wrote from Ellsworth that she had seen a male that day, and the birds had been reported in town for about three weeks. Mrs. Augusta (W. H.) Gardiner of Bucksport wrote:—"I first saw the birds on December 31, 1915. There were but two of them. In January, 1916, small flocks numbering from four or five to a dozen were seen. . . . About February 17 they seemed to increase in numbers to forty or fifty: they stayed through April and along into May, my latest date is May 11, [1916]."

PENOBSCOT COUNTY.—Jan. 13, 1916, Dr. Wallace Craig at Orono, wrote: "Two of us saw a flock of Evening Grosbeaks here yesterday." Dr. Craig furnished a carefully prepared copy of observations in his possession showing date, place, number of birds and name of observer. This report shows dates between Jan. 12 and April 10, 1916, at Orono, chiefly on the State University campus, and at Bangor and Stillwater. Twenty is the largest number reported (seen March 5), in the list, with most of the definite numbers ranging between this number and ten.

The list shows the larger numbers to have been observed from March 4 (eighteen) to March 19 (fifteen). Norman Lewis in the 'Bangor Commercial' for April, 1916 published a signed letter reporting over a hundred seen at Hampden. Later in 'Bird-Lore'

Mr. Lewis¹ stated that they were first seen in Hampden, March 17 and remained until April 26, and that the large flock mentioned was seen on April 1.

SOMERSET COUNTY.—On April 16, 1916 Mr. J. Merton Swain, who travels extensively in south central Maine, reported Evening Grosbeaks in the following Somerset County towns:—Bingham, Flagstaff, New Portland, North Anson, Pittsfield, Solon, and Skowhegan, in flocks of from ten or fifteen to forty and fifty, with adult males predominating.

KENNEBEC COUNTY.—From Mr. Arch Hiram Morrell, of Gardiner, we have the information that the birds were noticed in Gardiner about the first of March, remaining as late as April 20. The first flock contained eight, about half males, while the largest flock seen at his place, on April 5, contained over seventeen birds. Mr. Morrell states, "about half were always males." In a later letter, he states that some remained until May 17.

On May 7, 1916, Miss Dora M. Norton, whose home is in Gardiner, wrote that a flock had been near her home "for something like two weeks when I left home nearly two weeks ago." There were twenty-five or thirty of the birds. Mr. Alton S. Pope reported two seen at Manchester, March 11 and stated that they had been reported from Augusta and Winthrop. Mr. J. Merton Swain (April 16) stated that he had seen flocks in Mt. Vernon, Readfield and Waterville.

KNOX COUNTY.—June 12, 1916, Mrs. Adelaide C. Bird, of Rockland, reported in full the bird's occurrence at that place. From her report we take this summary. First seen, Feb. 16, a young male; a dozen March 7; large flocks April 9; and small numbers seen at various dates through April. The last were seen April 28. Mr. Niven C. Kallock, of Warren, reported Feb. 13 one male; Feb. 15 two males and a female, and two on April 2, all at Warren; and a male at Thomaston, March 27.

SAGadahoc COUNTY.—Miss Nellie F. Donton of Bath on April 3, reported that a pair had been seen there. A week later she sent a clipping from the Bath 'Daily Times' of April 13, reporting that the teachers and pupils of the Weeks Street Grammar school had

¹ 1916: Lewis, *Bird-Lore*, XVIII: 368.

observed a flock of over fifty Evening Grosbeaks in woods at the foot of Cherry Street in that city.

FRANKLIN COUNTY.—Resuming Mr. Swain's long list of stations we find the following Franklin County towns — Eustis, and Stratton, Farmington, Kingfield, Phillips and Strong. At Farmington, writes Mr. Swain, "They came early in January, and have been feeding on the bank in front of my house every day since." In a more recent letter, he states that on Sunday, May 28, 1916, they were in the usual numbers, "and on Monday morning I heard them as I went to take the train . . . we counted about thirty-five or forty on the 28th."

ANDROSCOGGIN COUNTY.—Carrie E. Miller has reported the appearance of the birds at Lewiston, Dec. 31, 1915. Seventeen were present late in January, increasing later to thirty-five.¹

OXFORD COUNTY.—Letters from Mrs. Albert D. Park of South Paris furnished the earliest record for the season, Nov. 27, 1915, when a female came to her premises, and "was here for some weeks before others were seen." On Jan. 9, 1916, eighteen were present, and she counted twenty-five in one flock during the winter. On April 4 she wrote, "three pairs or more were here yesterday." and later: "A female Evening Grosbeak was seen in our Village on June 4th." In her note of April 4 she stated, "They have been coming about four years."

CUMBERLAND COUNTY.—A single immature male was seen by Miss Gertrude Morse, at Cape Elizabeth, Jan. 18, 1916. Miss Morse also furnished a report of the occurrence of four males and one female seen at Gorham, Feb. 19, 1916. March 3, 1916 Mr. Eben Corey reported the observation of two males at the Western Cemetery, Portland. The birds took up permanent quarters in this western section of the city, increasing considerably in numbers until late March, when they decreased. After March 31 the writer failed to find them or to hear of their presence until April 11, when a single female was found at the cemetery. On May 5 Mr. Storrs Brigham observed about a dozen there. On May 8 four females rewarded his search and on May 9 and 10 he saw apparently the same birds. May 10 is the latest reported

¹ 1916: Miller, *Bird-Lore*, XVIII: 180.

occurrence in Portland this season. During March occasional small groups, pairs or single birds were reported as seen in other parts of Portland, but so far as the writer learned none became settled for any length of time, except those at the Western section.¹

At Brunswick Miss Edith Boardman saw five females on March 12 and a male and a female March 20, 1916. On March 14 Philip Cobb wrote: "Seven Evening Grosbeaks on the campus (Bowdoin College, Brunswick) today." Dr. O. A. Gross also wrote, "I saw a flock of seven on Bowdoin Campus (Brunswick) from March 18th to March 30th, 1916." At Pine Point, in Scarborough, Mr. Fred S. Walker saw five in his garden on several occasions, between March 27 and March 31, 1916. In a letter in the 'Portland Daily Press' of April 17, Mrs. Reuben Johnson reported a flock of "at least twenty April 14th and 15th on Long Island, in Casco Bay." At South Windham Mr. Fred Shaw saw "about twelve April 11th" (1916). At Westbrook Mrs. F. M. Ray saw two at Saccarappa cemetery which remained all day Feb. 25, 1916, while a short distance away, two were seen early in March for several days. On May 6 Mrs. Ray saw a single female.

YORK COUNTY.—Mr. Wm. E. Bary of Kennebunk reported several single birds, and small flocks of from four to six at various times during the winter in different parts of that town. Mrs. Fred P. Abbott, of Saco, also reported their presence in Saco and Biddeford.

The season of 1916-17 again found the birds in Maine, from Nov. 4, 1916, to June 2, 1917.

The winter was one of the coldest for many years, with an unusual amount of snow which covered the ground from December well through the month of March. In the city of Portland, the Rowan, Red, and Black Cherry trees, which in other seasons have afforded these birds much winter food, had borne no fruit. These conditions may partly explain the fact that the birds usually appeared in wandering bands, until the ground became bare in late March and April, when they again became settled for the remainder of their stay. But while the snow covered the ground the birds

¹ In Bird-Lore, 1916, XVIII: 249. Miss Sara C. Eastman reports the occurrence of the birds at Portland.

were seen for a few days in a place while some food was available. or they made a single visit and were not seen again.

A considerable number of local reports were gathered, again showing a wide invasion, and the number of birds present, rather large.

WASHINGTON COUNTY.—On January 27, 1917, Mr. Clarence H. Clark wrote, "The Evening Grosbeaks are visiting this section again this winter: have heard of no large flocks, only scattering birds."

PENOBSCOT COUNTY.—Arch Hiram Morrell under date of December 31, 1916 wrote "I have met some people who said the Evening Grosbeaks were staying in Bangor. They had seen them since about two weeks before Christmas. There were five in all, four males. The birds visited a Pine tree near their house, apparently getting food near the tips of the branches."

Mrs. Mary L. Morse, of Orono, on April 28, 1917, wrote, "The Evening Grosbeaks were here this winter but in less numbers, and people who saw them both winters seem to think they were not as frequently seen.—They were reported several times during the winter by members of the club who live in Bangor."

KENNEBEC COUNTY.—Miss Dora Norton, on April 18, 1917 wrote from Gardiner: "The flock this year is about" going from a point "in Farmingdale, about a quarter of a mile as the crow flies. They have been seen in quite another part of the city, in the vicinity of Lincoln Avenue."

SAGadahoc COUNTY.—Miss Nellie F. Dunton, under date of March 30, 1917 says, "Dr. E. J. Marston saw a flock of possibly twenty-five three weeks ago last Sunday [i. e. Feb. 18, 1917] in the outskirts of Bath, mostly grey, only two or three yellow that he could see. He saw four of them some two or three weeks earlier on Center Street in town."

CUMBERLAND COUNTY.—Early in February, Philip Cobb reported that he had seen two males and three females on January 26 and 27 on the campus of Bowdoin College in Brunswick. April 5, 1917 Dr. Alfred O. Gross of Bowdoin College, wrote, "Mr. G. H. Brewster, who is specializing in bird work here, reports a group of seven, which were seen most every day from January 16th to February 5th and again March 1st (1917). I have two records

for Brunswick, January 20th, five; and February 25th, three." In Portland the first reports came to hand on January 11, 1917 and through that month, February, March and April, flocks of from five to twenty were seen at Cape Elizabeth, Portland, East Deering, Deering Center and Westbrook.

The writer saw seven in the western cemetery, Portland, May 4 and they were said to have been present several days later. At Falmouth Foreside Mr. Walter H. Rich saw an adult male in his garden June 2 at close range, and later in the day it returned with a dull colored companion. None were seen after this date.

OXFORD COUNTY.—Mrs. Albert D. Park wrote "I first observed the Evening Grosbeaks November 4th, 1916, [at South Paris] and they have been here all winter. March 26th [1917], I heard them, but as I went away for the week cannot say that they are there now [April 1]." Last fall the largest number seen was thirty-three; later from eight to fifteen."

YORK COUNTY.—Mr. John F. Dana of Portland, reported a small flock seen by him in the town of Alfred.

Gifted with a striking richness of plumage, a phlegmatic disposition in which fear is but poorly developed, having a written history¹ in which mystery, and romance have been involved, and having invaded a wide territory within a relatively short time, the Evening Grosbeak has received much attention wherever it has appeared. Hence it has an extensive, though scattered and fragmentary literature, in which its history, its winter habits, its food prefer-

¹ The bird was first collected by an Indian boy at St. Sault Marie, M. (ichigan) T. (erritory) April 7th, 1823 and sent by H. R. Schoolcraft, an early American scientist, to Wm. Cooper, who described it as new in 1825 (Ann. N. Y. Lyc. N. H. 1: pt. ii: 219, 221). It was believed to be crepuscular, remaining in the deep shade of evergreens woods by day, sallying forth with "A singular strain" at twilight: hence the names *vespertina*, Evening Grosbeak, and *Hesperiphona*. Audubon's account (Orn. Bio. IV: 575) pertains chiefly to the subspecies long recognized as *H. v. montana* Ridg. part. probably *H. v. californica* Grinnell. Brewer's treatment 1874 (Hist. N. Am. Bds. I: 449), is a history of the entire species as then known. Coues, "History of the Evening Grosbeak," 1879 (Bull. Nutt. Orn. Cl. IV: 65, 75), is a review of the genus *Hesperiphona* in which of course *vespertina* is the central figure. Butler's Notes on the Evening Grosbeak, 1892 (Auk, IX: 238, 247), is a review chiefly of *H. vespertina vespertina* up to the close of the winter of 1889-90. In this paper the geographical features of its migration are predominant. A considerable number of summaries of its local occurrence have appeared in faunal lists and other regional papers.

Roberts' 'The Evening Grosbeak in Minnesota,' 1910 (Bull. Minn. Acad. Sci. IV: 406, 414) is a monographic article of general interest.

ences and feeding habits, its anatomy, its migration, and its habits in captivity have been more or less fully told.

A survey of this extensive literature shows that its migration eastward has been accomplished by a gradual range extension, rather than by a sudden invasion.

In 1825,¹—if not a few years earlier, according to Schoolcraft, the species was said to be common about the head of Lake Superior at Fond du Lac, etc., and during the first week of April 1823, a small flock was observed at Sault St. Marie, Michigan, from which the type was taken. It is also stated in the same article that in August of the same year Maj. Dealfeld observed a small flock near the Savannah River, northwest of Lake Superior.

For about thirty years it seems to have received no public notice, and whether it made visits to this southeastern part of its range is not known.

In 1853, P. R. Hoy² still reported it as “not uncommon” in Wisconsin.

During the early fifties it began to make its appearance farther and farther to the eastward, with more or less regularity and increasing frequency.

In 1854 a flock of five or six visited Toronto in December³ and since the bird was present near Hamilton in April 1855,⁴ we find possible if not probable evidence of wintering.

In 1858 it was observed and at least one specimen taken in northern Illinois.⁵

In March 1860, small numbers were present near Cleveland, Ohio.⁶

During the winter of 1861 and '62, it was present in the northern part of Huron County, Ontario,⁷ and in May, 1863, at

1825, Cooper quoting Schoolcraft, Ann. Lyc. N. H., N. Y., I: 221.

² Hoy, 1853, Proc. Phil. Acad., N. S., VI: 383. Here we may notice also Dr. Hoy's remarks on “Man's Influence on the Avifauna of Wisconsin” (1885, Proc. Nat. Hist. Soc. Wisc.) as having some possible bearing upon the initial migration eastward. He says: “*Hesperiphona vespertina* was formerly not uncommon in late fall and early spring in the Maple forests feeding on the seeds. . . . None have been seen here for the last twenty years. The Sugar Maple groves are nearly all converted into cordwood and the wheat occupies the cite once visited by this northwestern bird.”

³ 1885: Seton, Auk, 11: 334. I have not seen Cottle's paper 1855, Can. Journ. III: 287.

⁴ 1892: Garnier, Proc. Can. Inst. III: 88.

⁵ 1859: Cassin, Proc. Phil. Acad., N. S., X: 191.

⁶ 1860: Kirtland, Ohio Farmer: March 24.

⁷ 1892: Garnier, Proc. Can. Inst. III: 88.

Woodstock, Ontario.¹ In 1865 one was taken in Huron County, Ontario.²

In 1866 it was included, without comment, in the list of birds observed in or near New York city.³

Butler, omitting McIlwraith's 1863 record, cites him as reporting it at Woodstock, Ontario, May, 1866. I find no other published report of this occurrence (?).⁴

Dr. Morris Gibbs reported its occurrence at Grand Rapids and Kalamazoo, Michigan, in March, 1869.⁵ In 1870, it was seen at Minneapolis in November,⁶ and at Toronto in late December,⁷ while through the winter of 1870-71 large flocks were recorded from Freeport, Illinois.⁸

Butler regards this as the "First extensive wandering of the Evening Grosbeak."⁹

Nelson, in commenting on its abundance in Northern Illinois in the winter of 1871, says of the next winter [i. e. 1872], "Much rarer . . . I am told that formerly it was of much more regular occurrence."¹⁰

During the autumn "About 1872" six were secured from a small flock near Eureka, Illinois, about one hundred and twenty miles south of the place mentioned by Brewer.¹¹

The following spring, March, 1873, it was observed at Kalamazoo, Michigan, indicating possible wintering south of the Lakes.¹² In 1874—date not given—one was shot in Huron County, Ontario.¹³

Some time during the winter of 1875, one was seen at Elizabethtown, Essex County, New York, by Mr. Cutting.¹⁴

¹ 1883: McIlwraith, Bull. Nutt. Orn. Cl. VIII: 146. Butler cites McIlwraith, May 1866; a typographical error?

² 1892: Garnier, Proc. Can. Inst. III: 88.

³ 1866: Lawrence, Ann. Lyc. N. H., N. Y., VIII: 289.

⁴ 1892: Butler, Auk, IX.

⁵ 1892: Butler, Auk, IX: 240.

⁶ 1892: Hatch, Birds Minn. 291.

⁷ 1885: Seton, Auk, II: 334.

⁸ 1874: Brewer, Hist. N. Am. Bds. I: 452.

⁹ 1892: Butler, Auk, IX: 247.

¹⁰ 1876: Nelson, Bull. Essex Inst. VIII: 104.

¹¹ 1881: Hay, Bull. Nutt. Orn. Cl. VI: 179.

¹² 1892: Butler, Auk, IX: 240.

¹³ 1892: Garnier, Proc. Can. Inst. III: 88.

¹⁴ 1875: Brewer, Proc. Bost. Soc. N. H. XVII: 451.

It is unfortunate that the last two records are without specific dates, which would enable us to determine whether they belong to one or to two seasons.

The season of 1878-79¹ found the birds in Kalamazoo County, Michigan, from Nov. 20 to May 6, and as far south as Lafayette, Indiana,² where one was taken, and as far west as Minnesota.³

In 1883-84 a migration of noteworthy proportions occurred, in Minnesota, Wisconsin and Iowa,⁴ with records from Indiana,⁵ and New York — the date of the last being July 8, 1882.⁶

In 1886-87 another extensive migration was observed, when the birds were more or less abundant,—sometimes in considerable numbers, from Wisconsin and Iowa, to New York, and from Ontario to Kentucky. The next migration 1889-90 carried the bird into Minnesota, Montreal and Maine, and southward to Pennsylvania. Since that time its occurrence in parts of the region east of Lake Michigan has been frequent and migrations of larger proportions have occurred in the easternmost states in 1910-11, 1915-16 and 1916-17.

With due consideration of the fact that we are dealing with a member of the Coccothraustinæ, a group in which many of the species are noted for the irregularity of their migrations we have found in the review just taken that the bird under consideration has been constantly extending its winter range eastward since 1854. It should also be remembered that the blank period in the bird's history between 1823 and 1853, as well as that in the early eighties, when its records begin to multiply, are periods when there were but few observers, and perhaps even fewer mediums of publication, to say nothing of the undeveloped habit of publishing personal observations. And we find to day, much force in Butler's statement,—“had there been the number of observers at those times there are now, we should have learned more of the extent of those dispersals.”

¹ 1879; Gibbs, Bull. U. S. Geol. Surv. Terr. V: 486.

² 1892; Butler, Auk, IX: 240.

³ 1910; Roberts, Bull. Minn. Acad. Sci. IV: 409.

⁴ 1888; Cooke, Bull. 2, U. S. Div. Econ. Orn. 178.

⁵ 1892; Butler, Auk, IX: 240, 241.

⁶ Coues; Bull. Nutt. Orn. Cl. VII: 250.

Hesperiphona is a genus with two known species which find suitable conditions for summer in the coniferous areas of alpine and boreal regions. The residents of alpine sections, retreat to the lowlands with more or less frequency in winter. Its ancient excursions to lower levels to escape severe conditions or famine must have been changed to wider ranging in search for food in winter which was always to be found in increasing abundance southward, producing eventually a definite migration southward as the need became urgent.

Increasing population, constantly pressing its members farther and farther southeastward, sooner or later found this subspecies at the practical southern limit of the coniferous forests in the Middle West. Such a condition in a prolific race would result in stagnation and decline through over population and competition; in a forced adaptation to widely different conditions in the land to the southward; or in a further invasion of the vast suitable region to the eastward.

It seems to require no draft upon the imagination, and no step into the realm of speculation, to realize that in this hasty review of this interesting history, we have seen the Evening Grosbeak, forced against the impassable barrier to its southern migration at the prairie region, slowly and steadily take its way eastward, to the Atlantic coast. Thus has our generation witnessed a species overflowing the bounds of its original habitat, and forming its route of migration along the line of congenial conditions as they exist to day!

Time is replete with instances no less remarkable than this, but it is indeed rare that man is permitted to witness them in the making.

IPSWICH BIRD NOTES.¹

BY CHARLES W. TOWNSEND, M. D.

SINCE my 'Birds of Essex County' was published in 1905 as a Memoir of the Nuttall Ornithological Club I have collected a large number of bird notes from that county which I expect in due time will be published as a supplement. The following notes are of especial interest and are recorded here:

Sterna caspia. CASPIAN TERN.—Although this splendid tern is a fairly regular transient visitor in the autumn I have no record of so many of them being seen together as in this present year when on Aug. 31, 1917, twelve flew south in a loose flock over Ipswich beach within two hundred yards of me. Their large size, bright red bills, black caps and snowy plumage made a very striking picture. Several emitted their characteristic harsh rasping cries.

Sterna dougalli. ROSEATE TERN.—When the Essex County memoir, was published in 1905, I noted that I had never seen the bird and that it was a "Rare transient visitor." Since then there has been a great increase in the number of Common Terns along this coast, and, since 1910, the Roseate Tern has been seen among them and has become more and more common so that this year at times it has even surpassed them in numbers. The bird is easily recognized as a whiter bird than the Common Tern and one with a longer tail. The dark bill at once separates it from the Common Tern with its red, dark-tipped bill. Some of its cries are especially characteristic. The "cloth-tearing" cry is easily recognized and especially the rather sweet double note suggestive of the call of the Ring-neck Plover, which at times is shortened and roughened so that it sounds like *chivy*.

Both the Common and Roseate Terns and also the Arctic Tern feed their full grown young at the beach at Ipswich. Some of these birds may have come from Muskegit on the south or the coast of Maine on the north. The abundance of the sand lance, *Ammodytes americanus*, which often fill the water in countless schools and leave with the falling tide a silvery covering to the sands, makes the Ipswich beach a favorite resort for terns. The young seem always to be hungry and call in a monotonous and beseeching way whenever an adult appears with a fish. There are three methods of receiving the fish from the parent:—either in the air, on the land, or on the water. In the air the feeding of the young is often a graceful and interesting performance. By a series of aerial evolutions

¹ Read before the Nuttall Ornithological Club, Oct. 15, 1917.

the adult and young reach a point where the transference of the fish directly from bill to bill is made so quickly that one often can not be sure that the fish is thrown or dropped or actually passed from mouth to mouth. I am inclined to think that all three methods are used.

On the sand beach the young sometimes collect in numbers, while the adults fish for them, and all the young seem eager to take food from any adult. On one occasion at Ipswich I saw an adult tern with a fish in its bill alight on the beach near two immature birds who both clamored loudly to be fed. Disregarding their cries it flew to a third immature bird but was soon off and alighted near an adult to whom it delivered the fish which was swallowed.

The process of feeding the young bird on the surface of the water, is perhaps the most interesting, and points to the former more aquatic ancestry of the terns. An adult flies screaming with a fish in its bill, the young responds by a beseeching call, flies towards the parent, and alights on the water still calling. The old one flies down and delivers the fish without alighting or doing so but for a brief moment. The thing is done so quickly that it is often impossible to know what happens. The young one as soon as it receives the fish flies up into the air. It is rare for adult terns to alight on the water.

I have great hopes that this and other species of terns will return to the upper beach and dunes at Ipswich to breed as they did fifty years ago.

Mergus serrator. RED-BREASTED MERGANSER.—The breeding range of this bird according to the 'Cheek-List' extends on the Atlantic Coast as far south as southern Maine. Mr. E. H. Forbush in his 'Game Birds, Wild-Fowl and Shore Birds of Massachusetts,' 1912, page 66, gives records of cripples raising broods of young on Cape Cod. Although it is common for a few birds to spend the summer at Ipswich I never saw any evidence of breeding until July 30, 1916, when I found a group of eleven young birds nearly full grown with an adult female. A few rods off swam an adult male in partial moult into the eclipse plumage. The male swam alone some distances up the beach, came ashore and preened himself. On being disturbed by my approach, he waddled down to the water and flapped over its surface, but appeared, owing to the moult, to be unable to fly. A week later he had regained his flying powers. The family in the brown dress kept together all summer.

On July 4, 1917, I counted a compact flock of thirty Red-breasted Mergansers off the beach. There were two adult males moulting into eclipse plumage and one or two adult females. The others were young birds as shown by their smaller size and by the close ranks they kept as they turned this way and that. The flock must have been composed of three broods that had united together, a habit I have observed in Labrador in the case of Eiders. I did not have a chance to observe these birds again until the last of August, when I found a flock of twenty-three Red-breasted Mergansers, all in the brown plumage, all swimming together in a close flock.

Asio wilsonianus. LONG-EARED OWL.—This owl is generally con-

sidered a good mouser and the farmer's friend. Fisher, in his 'Hawks and Owls of the United States,' 1893, p. 140, says, "The Long-eared Owl is one of our most beneficial species, destroying vast numbers of injurious rodents and seldom touching insectivorous birds." The following record, which is very exceptional, puts him in another category.

On June 3, 1917, I visited a nest of this species, of which I had been kindly informed by Mr. C. E. Clark, in a pitch pine grove in the Ipswich dunes. Four days before Mr. Clark had found three young in the nest. This, probably an old Crow's nest, was in a pitch pine about twenty feet from the ground. Only one young was to be found and it was in the tree ten feet from the nest. It was in white down with a dark face and with ear tufts of white down. An adult bird flew about among and over the trees, alighting from time to time near the nest. Once it was mobbed by three Crows as it flew above the trees, but easily eluded them. This was in the middle of a sunny day. It constantly uttered low notes which suggested at times the barking of a small puppy, at times the notes *ud-hunk*.

There were numerous pellets around the foot of the tree and the whole upper part of the nest was heavily thatched with feathers and a few bones. I sent all the pellets I could find to the Biological Survey in Washington, and a month later some more pellets and the upper layers of the nest. The first report is as follows:

Contents of about 10 pellets: Red-winged Blackbird 1, Savannah Sparrow 1, Vesper Sparrow 1, Chipping Sparrow 1, Song Sparrow 1, Chewink 1, Black and White Warbler 1, Yellow Warbler 1, Pine Warbler 1, Maryland Yellowthroat 1, Thrushes sp. 2, other passerine birds (indeterminate) 2, Short-tailed Shrew 1, Jumping Mouse 10, Meadow Mouse 7.

The second set of pellets brought the following report:

Red-winged Blackbird 1, Sharp-tailed Sparrow 1, Song Sparrow 1, Yellow Warbler 1, Warblers sp. 2, Brown Thrasher 1, other passerine birds 2, Short-tailed Shrew 1, White-footed Mouse 1, Jumping Mouse 1, Meadow Mouse, 4.

It will be seen that this pair of owls had eaten some thirteen different species of birds and twenty-three individuals; also four species of mammals and twenty-five individuals.

Mr. E. W. Nelson in a letter of June 21, 1917, commenting on these findings says: "This is an interesting lot of pellets, as it is very unusual to find the long-eared owl feeding upon birds to such an extent. In a large number of pellets examined from winter roosts of these birds, we have found the bird remains making up considerably less than 10 per cent of the total animal contents. The owls in question must have had exceptional opportunities to secure birds, and the breeding season may also have had some effect in producing this habit." The Ipswich dunes are, as I have always maintained, particularly good regions for birds, and this owl seems to have had the instincts of a collector.

Ceryle alcyon. KINGFISHER.—This bird is believed to be such an exclusive fish eater that any deviation from this diet is worth recording.


Early in August, 1917, Mr. John Hair, gamekeeper of Mr. R. T. Crane at Ipswich, missed six of a four days old brood of Bob-whites. He had seen a Kingfisher nearby and later the same day saw it perched on the gable end of the little house where the Bob-whites had been hatched, and from there pounce on the young birds as they ran in and out. He shot the Kingfisher, and, on opening the bird, a female, found the legs and feathers of the young Bob-whites in its crop.

Most authors state that the Kingfisher is exclusively a fish eater. Knight, 'Birds of Maine', 1908, p. 270, says Kingfishers feed on "grasshoppers, also crickets, butterflies and moths, which latter two I have seen the birds take while on the wing, chasing them until they are caught." Weed and Dearborn, 'Birds in their Relations to Man,' 1903, p. 192, say: "The food consists principally of fish, but occasionally mice, frogs or grasshoppers are captured." I have been unable to find in literature any record of the capture of birds by Kingfishers.

NOTES ON NORTH AMERICAN BIRDS.

V.

BY HARRY C. OBERHOLSER.

THE notes below presented¹ concern the status of four North American birds. These are, respectively, members of the families *Buteonidæ*, *Regulidæ*, and *Fringillidæ*. 

Astur atricapillus (Wilson).

Dr. Ernst Hartert has recently² included the North American Goshawk, *Accipiter atricapillus* Wilson, among the subspecies of the European Goshawk, *Astur palumbarius* (Linnæus), or, as he calls it, *Accipiter gentilis* (Linnæus). Examination of a series of

¹ For previous papers in this series, cf. 'The Auk,' XXXIV, April, 1917, pp. 191-196; XXXIV, July, 1917, pp. 321-329; XXXIV, October, 1917, pp. 465-470; and XXXV, January, 1918, pp. 62-65.

² Vögel paläarkt. Fauna, Heft IX (Band II, Heft 3), October, 1914, p. 1146.

both birds shows that Dr. Hartert is probably correct in his view of the status of the American bird. The latter differs from *Astur gentilis* in its more mottled or irregularly barred lower parts; but individual variation in each of the two races bridges this difference. The American Goshawk is certainly a very distinct form, but is best regarded as a subspecies of the European bird. The two American subspecies should therefore be called *Astur gentilis atricapillus* (Wilson); and *Astur gentilis striatulus* Ridgway.

Regulus satrapa Lichtenstein.

Mr. C. E. Hellmayr some time ago¹ considered the American Golden-crowned Kinglet a subspecies of the European Golden-crested Wren (*Regulus regulus*). Recent comparison of a series of specimens of both shows that this is undoubtedly the relationship of the two birds, for, although their ranges are entirely separate, being cut off by the Atlantic Ocean, they are fully connected by intermediate individuals, and, therefore, from a modern standpoint are, of course, subspecies. As there is no question regarding the subspecific relationship of the Western Golden-crowned Kinglet (*Regulus satrapa olivaceus* Baird), our two Golden-crowned Kinglets must now stand as *Regulus regulus satrapa* Lichtenstein, and *Regulus regulus olivaceus* Baird.

Passerella iliaca altivagans Riley.

The Fox Sparrow described by Mr. J. H. Riley as *Passerella iliaca altivagans*,² from the Moose Pass Branch of the Smoky River, Alberta, has been discredited by most subsequent authors. Further study of this bird, however, shows that it is a good form, most closely allied to *Passerella iliaca*, but differing in its more rufous upper parts, including the outer webs of the secondaries and tertiaries and of the tail; and in the more rufescent spots on the lower surface. From other races of *Passerella iliaca* it is so different as

¹ Wytzman's *Genera Avium*, XVII, 1911, p. 8.

² Proc. Biol. Soc. Wash., XXIV, November 28, 1911, p. 234.

scarcely to need comparison. It therefore should be restored to standing among reputable subspecies. It breeds from at least central Alberta to northern British Columbia, and occurs in migration or winter south to Montana, Oregon, and California.

Melospiza melodia inexpectata Riley.

The Song Sparrow described by Mr. J. H. Riley¹ as *Melospiza melodia inexpectata*, from near Moose Lake, British Columbia, has been by most authors considered invalid. A reëxamination of the type material, together with a considerable number of additional specimens which have accumulated since the publication of the original description, bears out the characters assigned, and shows, moreover, that it is a good race with a well-defined geographic distribution. It is most nearly allied to *Melospiza melodia rufina*, but is decidedly smaller, particularly in so far as the bill and wing are concerned; and is, in fact, a smaller, darker, somewhat heavily streaked edition of that bird. It can by no means be considered merely an intermediate between *Melospiza melodia merrilli* and *Melospiza melodia rufina*. It occupies an extensive area, ranging, as it does, from central Alberta to northern British Columbia.

¹ Proc. Biol. Soc. Wash., XXIV, November 28, 1911, p. 234.

NOTES ON THE SUBSPECIES OF *NUMENIUS*
AMERICANUS BECHSTEIN.

BY HARRY C. OBERHOLSER.

THE description by Dr. Louis B. Bishop of a new race of *Numenius americanus*¹ has drawn recent attention to this species. The present writer's work on the identification of the examples of this curlew from Texas and other localities in the collection of the Biological Survey in the United States National Museum serves to confirm Dr. Bishop's subspecific separation of the small race inhabiting the northern United States and southern Canada. Furthermore, this investigation has brought out some interesting points, particularly in the geographic distribution of the two forms, which did not appear in the original account of this new subspecies, and which now seem worth while placing on record.

In this connection we have examined a total of 279 specimens, which represents the combined series of the United States National Museum, including the Biological Survey, the Museum of Comparative Zoölogy, the Academy of Natural Sciences of Philadelphia, the American Museum of Natural History, and the Brooklyn Museum of Arts and Sciences; together with the private collections of Mr. John E. Thayer, Mr. William Brewster, Mr. A. C. Bent, Dr. Jonathan Dwight, Dr. Louis B. Bishop, and Dr. L. C. Sanford. To the authorities of the above mentioned museums and to the other gentlemen who have kindly placed material at our disposal we wish here to express our sincere thanks. We are also indebted to Mr. Charles Chubb of the British Museum for measurements of birds in the collection of that institution, which have made possible the subspecific identification of important specimens at present unavailable for our examination.

***Numenius americanus americanus* Bechstein.**

N[umenius]. americanus BECHSTEIN, in Latham, Allgem. Uebers. Vögel, IV, ii, 1812, p. 432 (New York and Hudson Bay).

¹ *Numenius americanus parvus* Bishop, 'The Auk,' XXVII, No. 1, January, 1910, p. 59.

Numenius longirostra WILSON, Amer. Ornith., VIII, 1814, p. 23, pl. XLIV, fig. 4 (coast of New Jersey).

Numenius melanopus VIEILLOT, Nouv. Dict. d'Hist. Nat., VIII, 1817, p. 306 (New York and Hudson Bay) (description based on the specimen described by Latham in Gen. Syn. Birds, III, part 1, 1785, p. 120, which came from New York; the Hudson Bay reference belongs probably to *Numenius hudsonius*).

CHARS. SUBSP.—Size large, particularly the bill and wing.

MEASUREMENTS.¹—Male: wing, 268–281 mm.;² tail, 109–128 (average, 121); exposed culmen, 139–155 (148); tarsus, 78–90.5 (86.5).

Female: wing, 268.5–298 (average, 286) mm.; tail, 121–136 (126); exposed culmen, 166–222 (196); tarsus, 83–92 (88).

TYPE LOCALITY.—New York.³

GEOGRAPHIC DISTRIBUTION.—Western United States (excepting the northernmost part) and Mexico to Guatemala. Breeds in the middle and western United States, north to southern Michigan (once at Jackson), southern Wisconsin (formerly), northern Iowa (formerly), southern South Dakota, southern Wyoming, and southern Idaho; west to central southern Idaho and northeastern Nevada; south to central Utah, central New Mexico, northwestern Texas (casually to southeastern Texas), and northern Oklahoma; east to southeastern Kansas (Neosho Falls, formerly), southeastern Iowa (formerly), and northern Illinois (formerly). Winters in the southern United States and Mexico, north to central California, southern Arizona, southern Texas, and Georgia; and south to southern Lower California, Oaxaca, Dueñas in Guatemala, and Cozumel Island, Yucatan. Migrates east to southern Ontario, southern Quebec, New Brunswick, Nova Scotia, and Newfoundland, and southward over the eastern United States. No certain record for the West Indies.

Remarks.—This is one of the shore birds that have greatly decreased during the last decade. It has disappeared entirely as a breeder from Michigan, Wisconsin, Illinois, Iowa, eastern Nebraska, and at least eastern Kansas; and also has become very rare, probably a mere straggler, as a migrant in the United States east of the Mississippi River, whereas it was formerly a common transient along the Atlantic Coast north at least to Massachusetts. The above-mentioned breeding of this species in Michigan is based on a set of eggs without date, now preserved in the United States

¹ Transposed into millimeters from the measurements given by Dr. Louis B. Bishop, in 'The Auk,' XXVII, No. 1, January, 1910, p. 60.

² The average given by Dr. Bishop for the wing measurements of the male of this form is evidently an error.

³ Designated by the American Ornithologists' Union Committee, Check-List of North American Birds, edition III, 1910, p. 124.

National Museum, which was collected by Mr. C. P. Davis at Jackson, Michigan. This seems to be the only authentic instance of its breeding in the State of Michigan. The breeding record from Neosho Falls, Kansas, above noted, is also authenticated by a set of eggs now in the United States National Museum, collected by Capt. B. F. Goss. A specimen obtained by Dr. E. A. Mearns at Cloverdale, New Mexico, on the Mexican Boundary Line, July 14, 1892, is a long way south of the southernmost part of the breeding range of this form, and, as will be noted, is indication that this species starts very early on its southward migration.

Specimens examined.— Altogether 89 examples of this subspecies have been examined, from the localities that follow:

Arizona.— Peck's Lake, Upper Verde Valley (April 20, 1886); Sonoyta Plains (August, 1901); Fort Verde (Nov. 8, 1886); near Naris, Pima County (Jan. 8, 1894).

California.— Monterey (Nov. 16, 1912); Berkeley (April 23, 1898); Hyperion, Los Angeles County (June 4, 1917); San Francisco; San Diego.

Colorado.— Spanish Peak (April 17, 1877).

Florida.— Tarpon Springs (Sept. 7, 1889; July 5, 1888); Gasparilla (Feb. 6, 1884).

Georgia.— Savannah (January, 1860); Sapelo (Nov. 19, 1887).

Idaho.— Dickey (June 8, 1912); American Falls (May 27, 1911).

Illinois.— Oaka (April 20, 1881).

Iowa.— Dickinson County (June 10, 1881).

Kansas.— Fort Hays (June 12, 1871).

Massachusetts.— Eastern Massachusetts (1847).

Missouri.— Near Snatch Creek (June 7, 1864).

Nevada.— Franklin Lake (June 24, 1898).

New Jersey.— Cape May (Sept. 14, 1880).

New Mexico.— Raton (May 10, 1901); Cloverdale, Mexican Boundary Line (July 14, 1892).

New York.— Bought in New York City (April 7, 1879); near New York (1841).

South Carolina.— Hilton Head (April 1, 1864).

South Dakota.— White River.

Texas.— Valentine (Aug. 12, 1902); Padre Island (Aug. 21, 1891); Point Isabel (Feb. 19, 1881; March 5, 1881); High Island

(Dec. 19, 1916); Rockport (Feb. 28, 1896); Nueces County (Oct. 9 and 10, 1912; Nov. 23 and 24, 1912); Corpus Christi (Sept. 16, 1886; May, 1882; Feb. 12, 1899; Mar. 12, 1899; Oct. 20 and 24, 1909); Brownsville (Feb. 3, 1897; Sept. 8, 1893; Nov. 9 and 10, 1914; Sept. 26, 1914; Dec. 11, 14, and 22, 1909; Nov. 18, 1909).

Utah.—Fairfield (July 28, 1890); Duckville Gun Club, mouth of Bear River (June 7, 1916); Hansen's Island, mouth of Bear River (May 29, 1916); south shore of Great Salt Lake (June 11, 1869); Antelope Island, Great Salt Lake (June 4 and 5, 1869).

Virginia.—No more definite locality given (March, 1872).

Wyoming.—Laramie Peak (June, 1864).

Lower California.—Mouth of Colorado River (May 15, 1915); La Paz (March 12, 1912; Feb. 7, 1887); San Quintin (July 4, 1906); Abreojos Point (March 16, 1911); San José del Cabo (Aug. 26, 1887).

Oaxaca.—Near Juchitan (Dec. 11, 1868).

San Luis Potosi.—San Luis Potosi (Feb. 7, —).

Tamaulipas.—Matamoros (Feb. 11, 1909).

Vera Cruz.—Jalapa; Tlacotalpam (Feb. 10, 1901).

***Numenius americanus occidentalis* Woodhouse.**

Numineus [sic] *occidentalis* WOODHOUSE, Proc. Acad. Nat. Sci. Phila., 1852, p. 194 (near Albuquerque, New Mexico).

Numenius americanus parvus BISHOP, 'The Auk,' XXVII, No. 1, January, 1910, p. 59 (Crane Lake, Saskatchewan).

CHARS. SUBSP.—Similar to *Numenius americanus americanus*, but decidedly smaller, particularly the bill and wing.

MEASUREMENTS.¹—Male: wing, 253.5–261 (average, 259) mm.; tail, 105–117 (112); exposed culmen, 106–145 (121); tarsus, 70–81 (74).

Female: wing, 252–275 (average, 266) mm.; tail, 104.5–116 (111); exposed culmen, 118–162 (147); tarsus, 73–88 (80).

TYPE LOCALITY.—Near Albuquerque, New Mexico.

GEOGRAPHIC DISTRIBUTION.—Southwestern Canada, the United States, Mexico, and Jamaica. Breeds north to southern Manitoba, southern Saskatchewan, southern Alberta, and southern British Columbia; west to central southern British Columbia, middle Oregon, and central northern

¹ Transposed into millimeters from the measurements given by Dr. Louis B. Bishop, in 'The Auk,' No. 1, January, 1910, p. 60.

California; south to northeastern California, central western Nevada (probably), southeastern Oregon, northern Idaho, southwestern Montana, central Wyoming, and northern South Dakota; east to northeastern South Dakota, eastern North Dakota, and central southern Manitoba. Winters in Mexico and the southern United States, north to central California, southern Arizona, southern Texas, southern Louisiana, Florida, and Georgia; and south to southern Lower California, Jalisco, and San Luis Potosi, Mexico. Migrates west to western Washington and western California, and east to Iowa; casually east to Rhode Island, New York, and South Carolina, and southeast to Jamaica.

Remarks.—This is a well differentiated subspecies, although its distinction rests entirely on size, the much shorter bill being one of the best and most readily appreciated characters. While typical specimens are easy to determine, geographic intermediates, such as occur in Wyoming and South Dakota, offer, as would be expected, sometimes difficult problems which are solvable only by average measurements or the average of characters present. An adult specimen taken at a nest near Fort Klamath, Oregon, on May 17, 1878, and now with a set of four eggs preserved in the United States National Museum, is apparently typical *Numenius americanus occidentalis*, and thus proves the southward extension of the breeding range of this form, as far at least as extreme northeastern California. It is probable that the curlews that breed in the lakes of the Carson Valley of central western Nevada, although not examined in this connection, are also of this race. No specimens of *Numenius americanus occidentalis* from south of the State of Jalisco in Mexico have been seen, but it doubtless will be found at least nearly as far south as the typical subspecies, i. e., to southern Mexico, and possibly to Guatemala.

In describing this race as *Numenius americanus parvus*,¹ Dr. Louis B. Bishop rejected the name *Numenius occidentalis* Woodhouse because he assumed that it was evidently an immature individual of *Numenius americanus americanus*, basing this assumption largely on the premise that it must have been collected before August 1. As a matter of fact, however, the type of *Numenius occidentalis* Woodhouse was collected near Albuquerque, New Mexico, on Aug. 20, 1851, by Dr. S. W. Woodhouse. It was

¹ 'The Auk,' XXVII, No. 1, January, 1910, p. 61.

deposited in the United States National Museum, where it was catalogued as No. 12644, and was subsequently mounted, but was unfortunately destroyed by mistake in March, 1888, along with a number of other supposedly worthless specimens. We have, however, a figure of the type specimen which was given by Woodhouse in his report on this collection;¹ and from this, together with the description and measurements given by Dr. Woodhouse,² it is evident that the bird is a representative of the small northern race subsequently described by Dr. Bishop as *Numenius americanus parvus*. These measurements are, in inches, as follows: wing, 11.50; bill, 4.20; tarsus, 2.80; middle toe, 1.35. That this individual should be found in New Mexico as early as Aug. 20 is by no means surprising or indicative of its identity with *Numenius americanus americanus*, since these birds are notoriously early migrants and move southward not infrequently in July. Examples of *Numenius americanus occidentalis* have been obtained in southern California on August 22, and on the island of Jamaica in July; while, as already noted,³ *Numenius americanus americanus* sometimes reaches the Mexican Boundary as early as the middle of July. We are therefore under the unfortunate necessity of sinking Dr. Bishop's name, *Numenius americanus parvus*, as a synonym of *Numenius americanus occidentalis* Woodhouse.

Specimens examined.—We have seen 190 specimens of this subspecies, from the following localities:

Alberta.—Many Island Lake, near Walsh, June 18, 1906 [nestling and adult]; Walsh (July 12, 1906 [juv.]); Calgary (May 18, 1904); western Assiniboia (June 1, 1905).

British Columbia.—Vernon (July 20, 1892); Lac La Hache (June 29, 1892); Okanagan (July 22, 28, and 29, 1902; Oct. 29, 1902; July 14, 1911).

Saskatchewan.—Hay Creek, Maple Creek (July 3, 1906); Hay Lake (May 29, 1905); Maple Creek (June 11, 1906); Crane Lake, Maple Creek (June 17, 22, 23, and 26, 1906; June 17, 1907); Big Stick Lake, Maple Creek (July 18, 1906; June 13, 1906).

¹ Sitgreaves' Rep. Zuni and Colorado Rivers, 1853, p. 98, pl. 6.

² *Loc. cit.*, p. 98.

³ *Antea*, p.

Arizona.—Near Naris, Pima County (Jan. 8, 1894); The Dam, Monument 179, Mexican Boundary Line (Feb. 9, 1894).

California.—Menlo (January, 1896); San Rafael (Jan. 6, 1883); Huntington Beach, Orange County (Aug. 22, 1915).

Colorado.—Larimer County (May 9, 1885); St. Charles River (Aug. 5, 1874); Denver Mills (Sept. 8, 1900).

Florida.—Gasparilla Pass (Feb. 5, 1884).

Georgia.—Sapelo Island (May 9, 1885).

Iowa.—No more definite locality given; Chariton (Mar. 21, —).

Louisiana.—Calcasieu Pass.

Missouri.—Bourbeuse River (Aug. 1, 1881).

Montana.—Pilgrim Creek, 10 miles northwest of Piniele (June 19, 1916); Pilgrim Creek, 6 miles northwest of Piniele (June 11, 1916); 5 miles southeast of Sykes (May 31, 1916); Bighorn River, 5 miles south of St. Xavier (May 31, 1917); Crazy Mountains, eastern foothills (June 21, 1917); 90 miles above mouth of Yellowstone River (July 28, 1856); Darnall's, Dawson County, 30 miles south of Glasgow (June 30, 1910); Mountain Sheep Buttes, 20 miles northwest of Colypso, Dawson County, (Aug. 9, 1909); near mouth of Milk River (July 31, 1874; June 30, 1874); mouth of Little Porcupine River (Aug. 8, 1875); Fort Benton; Powder River, 10 miles northeast of Broadus (June 19, 1916); Boxelder Creek, 10 miles northeast of Piniele (June 10, 1916); Boxelder Creek, 12 miles northeast of Piniele (June 10 and 19, 1916).

Nebraska.—No more definite locality given.

New Mexico.—Ten miles northwest of Capitan Mountains (Aug. 28, 1903); Mexican Boundary Line, Long. 30° 15', near Emory Monument 5 (Mar. 22, 1892).

New York.—Montauk Point.

Oregon.—Pendleton (June 6, 1896); Fort Klamath (shot at nest containing 4 eggs, May 7, 1878).

Rhode Island.—Jamestown (Sept. 9, 1897).

South Carolina.—Egg Bank, Ladies Island (May 27, 1867).

South Dakota.—Cheyenne River, Custer County (July 12, 1894); Spring Creek, Custer County (May 27, 1894).

Texas.—Nueces County; Sept. 14, 1912; Oct. 9, 10, 11, 19, 24, 25, and 26, 1912; Nov. 17, 19, 21, 22, 23, 25, 28, and 29, 1912);

Nueces Bay (April 5 and 12, 1889); Corpus Christi Bay (April 13, 1889); Brownsville (Dec. 11, 1888; May 16, 1877; Feb. 3, 1897; Nov. 20, 1896; Dec. 4, 5, 7, 9, 14, 15, 16, 18, 19, 21, and 22, 1909; Dec. 2, 1887; Nov. 8, 16, 19, and 27, 1909; Feb. 21, 1902; Jan. 6, 1899; Sept. 19, 22, 24, and 25, 1914; Sept. 8, 1893; Oct. 1, 2, 5, and 7, 1914); Cameron County (Oct. 7, 1913; Oct. 1, 1914); Point Isabel (Feb. 18, 1881); Fort Clark (Feb. 22, 1893); Fort Stockton (Aug. 30, 1877); Aransas County (Sept. 3, 5, 8, and 22, 1912); Corpus Christi (March 10, 1877; May 29, 1891; Feb. 12, 1899; Oct. 11 and 18, 1909).

Utah.—Fillmore (Nov. 19, 1872).

Washington.—Near Fort Steilacoom (Aug. 1, 1856); Fort Sanders.

Wyoming.—Little Box Elder Creek, Converse County (June 25, 1890; April 25, 1892); Crook County (June 14, 1904); Newcastle (May 22, 1894); Black Hills (Aug. 4, 1856); Main Fork, Medicine Bow River (Aug. 6 and 7, 1856).

Chihuahua.—Chuechupa (Sept. 16 and 17, 1905); Nuevo Casas Grandes (Sept. 4, 1901).

Durango.—Rancho Santuario (Feb. 22, 1903).

Jalisco.—La Barca (Jan. 8, 1903).

Jamaica.—Passage Fort (July, 1863).

Lower California.—Cape San Lucas (Sept. 15, 1859); La Paz; San José del Cabo (Sept. 19, 1887; February, 1860); San Lazaro Mountains (January, 1860); Magdalena Bay (March 21, 1911); San Quintin (July 7, 1906).

San Luis Potosi.—San Luis Potosi (March 3, —).

Tamaulipas.—Matamoros (Jan. 23, 1909).

A NEW SPECIES OF LOON (*GAVIA VIRIDIGULARIS*)
FROM NORTHEASTERN SIBERIA.

BY JONATHAN DWIGHT, M. D.

THERE has been a good deal of confusion regarding the status of the Black-throated Loon (*Gavia arctica*) and its allies. Two instances may be cited. Hartert states that "According to Buturlin both *G. arctica* and *G. pacifica* are found breeding side by side in areas of thousands of miles. We cannot therefore treat them as geographical forms of one species" (Hand-List of British Birds, 1912, p. 159), and Hersey in his recent review of this species says that "three Alaskan specimens when compared with available material from Siberia and northern Europe prove to be the Asiatic form *Gavia arctica suschkini* Sarudny, and not *Gavia arctica arctica* (Linnaeus)" (Auk, XXXIV, July 1917, p. 289). Mr. Hersey informs me that his birds have green throats, but as a matter of fact, *suschkini* is a purple-throated bird and undoubtedly a race of *arcticus* as claimed by the describer, N. A. Sarudny. For the benefit of those who do not read Russian, wherein much of the present tangle lies, I have obtained a translation of the original description kindly made by my friend Mr. Roman de Majewski. It appeared in a Moscow journal which bears a title in three languages, Russian, French and German, and the citation therefore is [Russian], = *Messenger ornithologique*, = *Ornithologische Mittheilungen*, 3rd year, 1912, No. 2, pp. 111-113, being a continuation of N. A. Sarudny's "[Russian title=] *Mittheilungen über die Ornithologie von Turkestan*."

142. *Urinator arcticus suschkini* subsp. nov.

The Striped Diver is to be found in Russian Turkestan during migration, and in winter-time. To judge by the specimens I have collected, they show such divergence from the types of the Pskovskoi and St. Petersburg provinces that in my opinion they should not be given the name *Urinator arcticus* (Linn.) but placed in a separate category.

From among the specimens of the Striped Diver which I have collected I will only cite the adults:

1. ? ♀ Near Amu — Daryi, Feb. 2, 1907.
2. ♀ Near Kok — Boowak, Nov. 4, 1907.
3. ♂ Kasalinsk, April 16, 1908.
4. ♂ Lake Chushka — Kool (near Turkestan City) June 10, 1908.
5. ♀ Lake Chushka — Kool (near Turkestan City) June 10, 1908.
6. ♂ At the source of the River Tar — Toogi, Dec. 22, 1909.
7. ? ♂ Nijni — Tchetchik, Winter 1909-10.
8. ? ♀ Boowaki, on the lower heights of Koorataou, Spring 1911.
9. ♂ Joolek, Baiga — Kum, March 28, 1911.

The divergences are the following: The gray color of the crown and the back of the neck of the Turkestan bird is lighter, though not quite as light as in *Urinator pacificus* Lawr. The explanation of this should not be sought for in moulting, as one might be led to expect by specimen No. 1, which is in process of changing its winter plumage for its summer one. In specimens Nos. 2, 6, and 7, we can notice very clearly that the parts above-mentioned are also lighter. The white horizontal bars on the shoulders and on the back are in most cases wider, even comparing the small Turkestan birds with the large Pskovkoi and St. Petersburg types. Also in most cases the white spots on the wings are larger. The front part of the neck seems to be darker and its purple sheen less developed.

In the greater number of cases our birds are smaller and their beaks are shorter. These two observations were already made by Mr. P. P. Suschkin (Birds of the Ufinskoi Region.— Birds of the Middle Kirgiz Steppes.) in the cases of Divers from the Ural and Turkestan regions. In my specimens the length of the wings and culmen are as follows:

	Wing	Culmen.
1.	11,6	2,3
2.	12,2	2,25
3.	12,23	2,32
4.	12,35	2,2
5.	12,1	2,26
6.	12,5	2,6
7.	12,12	2,35
8.	12,7	2,3
9.	11,8	2,27

(In typical *U. arcticus*, the length of the wing varies between 12,15" and 13,2", and the culmen between 2,5 and 2,85. In *U. pacificus* the wing is 11,2"-12,25" and the culmen 2"-2,35".)

The extremity of the beak in the Turkestan Diver, is shorter and higher

in proportion, compared to the Northern ones; the gonys, in most cases forms a sharper angle.

This notice about the Diver I dedicate to P. P. Suschkin.

It is quite obvious from the foregoing translation that *suschkini* is merely slightly differentiated from the purple-throated *Gavia arcticus* and as *pacificus* is also a like variation, it follows that the green-throated birds are without a name, for the synonyms of *arctica* refer without exception to European birds. My attention was first directed to the Siberian birds some years ago by Dr. L. B. Bishop when we were examining skins of Loons at the American Museum of Natural History. I propose for them the following name:—

***Gavia viridigularis* sp. nov.**

TYPE.—No. 76665, American Museum of Natural History; adult male; Gichega (or Ghijiga) northeastern Siberia; September 16, 1894; collected by N. G. Buxton.

DIAGNOSIS.—The green coloration of the throat is the essential character that sets this species apart from *arctica* and its races, which all have purple throats.

DESCRIPTION OF TYPE.—Top of head smoke gray, paler and drab-tinged on nape, sides of head darker and purplish, rest of upper surface a slightly lustrous greenish-black, the scapulars with twelve to fourteen broad (6-7 min.) white bars of quadrate spots, the sides of the hind neck with ten or twelve similar though narrower bars and the outer surface of the wings with small semi-ovate white spots. The throat is a velvety dusky olive-green if held towards the light and an olivaceous black with slight purplish tints if held away from it; the upper part of the throat and the chin are a darker green much like the back. The throat is bordered by narrow white stripes enclosing broader stripes of black and it is crossed at its upper part by about ten short white longitudinal stripes; numerous narrow black and white streaks radiate from its lower border along the sides of the jugulum. The wing quills, the tail, the under tail coverts, the tibiae, and an obscure line across the anal region are dusky. The lining of the wing is white. The bill in dried skins is a dull grayish-black, and the feet are black. Measurements (in millimeters) — wing 322, tail 59, tarsus 90, toe with claw 115, culmen 69, depth of bill 17.

The sexes are alike in plumage but the female is slightly smaller. Average of two males, wing 321, tail 59.5, tarsus 88, toe with claw 108.5, culmen 68, depth of bill 18:—average of five females, wing 316, tail 58.2, tarsus 82.6, toe with claw 101.6, culmen 64, depth of bill 17.

RANGE.—Northeastern Siberia and extreme western Alaska.

The Green-throated or Siberian Loon may prove to be only subspecifically separable from its purple-throated relative, the Black-throated or Arctic Loon, but there seems to be a distinct qualitative difference between the green and the purple of the respective throats, that merits specific recognition. Except for this striking difference *viridigularis* and *arctica* are much alike in coloration, although the former has wider white bars on the scapulars and the upper parts are green-tinged rather than purplish as in *arctica*; the former too is, perhaps, a little larger in all dimensions. Specimens of *arctica* no matter how they are held to the light show a velvety purple on the throat that looks black in a poor light, while those of *viridigularis* are wholly green when held between the observer and the light and they develop a tinge of brownish-purple only if held in the opposite direction. I have seen one or two specimens that are somewhat intermediate between the two species but there is a gap that remains to be bridged.

We have then *Gavia arctica arctica* the northern European bird with *Gavia arctica suschkini*, a southern race in Turkestan and *Gavia arctica pacifica* its representative in Arctic North America,—all three purple-throated, and *Gavia viridigularis* a green-throated species that occupies a range in eastern Siberia. Buturlin as quoted may have mistaken *viridigularis* for *pacifica* which would account for his “*arcticus*” and “*pacificus*” breeding side by side, but however this may be, we have to reckon with a green-throated bird that hitherto has been without a name.

THIRD ANNUAL LIST OF PROPOSED CHANGES IN THE A. O. U. CHECK-LIST OF NORTH AMERICAN BIRDS.

BY HARRY C. OBERHOLSER.

THIS is the Third Annual List of proposed A. O. U. Check-List additions and changes in the names of North American birds. Like the First and Second,¹ the present list comprises only ornithological cases,—*i. e.*, such as require specimens or the identification of descriptions for their determination, and consists of additions, eliminations, rejections, and changes of names due to various causes. However, only changes known to be based on revisionary work are included; therefore no mention is here made of changes involved in names used without sufficient explanation in local lists or elsewhere.

This list is intended to include everything pertinent up to December 31, 1917, and nothing after that date has been taken. In view of the volume and widely scattered character of current ornithological literature, it is not at all unlikely that some names have been overlooked, and the writer would be very thankful for references to any omissions, in order that such may be duly given a place in next year's list. For assistance of this kind relating to the present list, the author is indebted to Mr. F. Seymour Hersey, Dr. Charles W. Richmond, and Mr. J. H. Riley.

Fratercula arctica arctica (Linnaeus) becomes, in so far as North America is concerned, **Fratercula arctica deleta** (Brünnich). *Alca deleta* Brünnich, Ornith. Borealis, 1764, p. 25. (Iceland). (Cf. Hartert, British Birds, XI, No. 7, Dec. 1, 1917, pp. 163-166.)

†**Coprotheres** Reichenbach, Natürl. Syst. Vögel, 1852 (1853), p. V (type, *Lestris pomarina* Temminck). Recognized as a genus. (Cf. Mathews, Birds Australia, II, pt. 5, Jan. 31, 1913, p. 497.) Includes the following North American forms now in the genus *Stercorarius*:

Coprotheres pomarinus pomarinus (Temminck).

Coprotheres pomarinus camtschaticus (Pallas).

†**Coprotheres pomarinus camtschaticus** (Pallas). *Catarractes camtschatica* Pallas, Zoogr. Rosso-Asiat., II, 1826, p. 312 (Kamchatka).

¹ For the two previous lists, see The Auk, XXXIII, October, 1916, pp. 425-431; XXXIV, April, 1917, pp. 198-205.

† Additions to the A. O. U. Check-List, the Sixteenth Supplement and the First and Second Annual Lists of Proposed Changes, are marked with a dagger (†).

- Recognized as a subspecies to include birds breeding in Alaska and Siberia. (Cf. Mathews, *Birds Australia*, II, pt. 5, Jan. 31, 1913, p. 498.)
- Pagophila alba** (Gunnerus) becomes **Pagophila eburnea** (Phipps) (*Larus eburneus* Phipps, *Voy. North Pole*, Append., 1774, p. 187), because *Larus albus* Gunnerus is not certainly identifiable. (Cf. B. O. U. Committee, *List Brit. Birds*, ed. 2, 1915, p. 394.)
- Larus thayeri** Brooks becomes **Larus argentatus thayeri** Brooks, because of intergradation with *Larus argentatus*. (Cf. Dwight, *The Auk*, XXXIV, No. 4, Oct., 1917, pp. 413-414.)
- †**Larus ridibundus** Linnæus, *Syst. Nat.*, ed. 12, I, 1766, p. 225 (Europe). Recorded from a specimen taken on the western coast of Greenland. (Cf. Schiøler, *Dansk Ornith. For. Tidssk.*, XI, Hæfte 3-4, Sept., 1917, p. 175.)
- Larus affinis** Reinhardt becomes **Larus fuscus affinis** Reinhardt. (Cf. Iredale, *Bull. Brit. Ornith. Club*, XXXI, No. CLXXXVI, March 29, 1913, pp. 68-69.)
- Larus atricilla** Linnæus becomes **Larus atricilla megalopterus** (Bruch) (*Atricilla megalopterus* Bruch, *Journ. f. Ornith.*, 1855, p. 287; Peru and Mexico), by recognition of the North American birds as subspecifically distinct. (Cf. Noble, *Bull. Mus. Comp. Zoöl.*, LX, No. 10, Aug., 1916, p. 367.)
- †**Calonectris** Mathews and Iredale. New genus. Mathews and Iredale, *Ibis*, ser. 10, III, No. 3, July 2, 1915, pp. 590, 592 (type, *Puffinus leucomelas* Temminck). (Cf. Mathews and Iredale, *Ibis*, 1915, pp. 590-594; Oberholser, *The Auk*, XXXIV, No. 4, Oct., 1917, pp. 471, 475.) Of North American species it includes only *Puffinus kuhlii borealis* Cory, which therefore becomes:
- Calonectris kuhlii borealis** (Cory).
- †**Ardenna** Reichenbach, *Natürl. Syst. Vögel*, 1852 (1853), p. IV (type, *Procellaria major* Faber = *Procellaria gravis* O'Reilly). Revived as a genus (cf. Mathews and Iredale, *Ibis*, 1915, pp. 590-591; and Oberholser, *The Auk*, XXXIV, No. 4, Oct., 1917, pp. 471, 475); and will include the following North American species now in the genus *Puffinus*:
- Ardenna carneipes** (Gould).
- Ardenna creatopus** (Coues).
- Ardenna gravis** (O'Reilly).
- †**Hemipuffinus** Iredale, *Austral Avian Record*, II, No. 1, Aug. 2, 1913, p. 20 (type, *Puffinus carneipes* Gould). Proposed (loc. cit.) as a genus to include *Puffinus carneipes* Gould. Accepted as only a subgenus of *Ardenna* Reichenbach. (Cf. Oberholser, *The Auk*, XXXIV, No. 4, Oct., 1917, p. 471.)
- Puffinus assimilis** Gould becomes **Puffinus assimilis godmani** Allen. *Puffinus godmani* Allen, *The Auk*, XXV, No. 3, July, 1908, p. 339 (Madeira). (Cf. Hartert, *British Birds*, VIII, No. 12, May 1, 1915, pp. 282-283; IX, No. 2, July 1, 1915, p. 56.)

†**Thyellodroma** Stejneger, Proc. U. S. Nat. Mus., XI, Nov. 8, 1888, p. 93 (type, *Puffinus sphenurus* Gould). Recognized as a genus (cf. Mathews and Iredale, Ibis, 1915, pp. 596-600; Oberholser, The Auk, XXXIV, No. 4, Oct., 1917, pp. 471-472). Includes the following species now in the genus *Puffinus*:

Thyellodroma cuneata (Salvin).

Thyellodroma bulleri (Salvin).

Puffinus pacificus alleni Mathews becomes **Thyellodroma cuneata** (Salvin). (Cf. Mathews and Iredale, Ibis, 1915, p. 600.)

Prifinus cinereus (Gmelin) becomes **Procellaria cinerea** Gmelin, because not generically distinct from **Procellaria æquinotialis**. (Cf. Mathews, Birds Australia, II, pt. 1, May 30, 1912, p. 106.)

†**Æstelata diabolica** (Lafresnaye). *Procellaria diabolica* Lafresnaye, Rev. Zool., 1844, p. 168 (Guadeloupe Island, West Indies). Records of *Æstelata hasitata* from several localities in the eastern United States prove to belong to this species. (Cf. Noble, Bull. Mus. Comp. Zool., LX, No. 10, Aug., 1916, pp. 370-374.)

Pelagodroma marina (Latham) becomes **Pelagodroma marina hypoleuca** (Moquin-Tandon) (*Thalassidroma hypoleuca* Moquin-Tandon, in Webb, Berthelot, and Moquin-Tandon, Orn. Canarienne, 1841, p. 45; Tenerife, Canary Islands), by recognition of an Atlantic subspecies. (Cf. Bannerman, Ibis, 1914, pp. 61-62.)

†**Oceanodroma hornbyi** (Gray). *Thalassidroma hornbyi* Gray, Proc. Zool. Soc. Lond., 1853 (July 25, 1854), p. 62 (northwest coast of America). Restored to the list of North American birds. (Cf. Oberholser, The Auk, XXXIV, No. 4, Oct., 1917, p. 466.)

†**Oceanodroma leucorhoa beali** Emerson. *Oceanodroma beali* Emerson, Condor, VIII, No. 2, March 20, 1906, p. 54 (Sitka Bay, Alaska). Revived as a species (cf. Willett, Condor, XVI, No. 2, March 15, 1915, p. 75); recognized as a subspecies of *Oceanodroma leucorhoa* (cf. Oberholser, Proc. U. S. Nat. Mus., LIV, Oct. 19, 1917, p. 168).

Oceanodroma socorroensis Townsend becomes **Oceanodroma monorhis socorroensis** Townsend. (Cf. Mathews and Iredale, Ibis, 1915, p. 580.)

†**Leptophaethon** Mathews. New genus. Mathews, Austral Avian Record, II, Nos. 2-3, Oct. 23, 1913, p. 56 (type, *Phaethon lepturus dorotheæ* Mathews). Includes only one North American species, now in the genus *Phaethon*:

Leptophaethon catesbyi (Brandt).

†**Scæophaethon** Mathews. New genus. Mathews, Austral Avian Record, II, Nos. 2-3, Oct. 23, 1913, p. 56 (type, *Phaethon rubricauda westralis* Mathews). Includes only one North American species now in the genus *Phaethon*:

Scæophaethon rubricaudus (Boddart).¹

†**Piscatrix** Reichenbach, Natürl. Syst. Vogel, 1852 (1853), p. VI (type,

¹ See Second Annual List, 'The Auk,' XXXIV, 1917, p. 199.

Sula candida Stephens = *Pelecanus sula* Linnæus). Recognized as a genus. (Cf. Mathews, Birds Australia, IV, pt. 3, June 23, 1915, p. 199). Includes one species now in the genus *Sula*:

Piscatrix sula (Linnæus).

Sula piscator (Linnæus) becomes **Piscatrix sula** (Linnæus), since the latter proves to be identical with the bird currently known as *Sula piscator*. (Cf. Mathews, Birds Australia, IV, pt. 3, June 23, 1915, pp. 206–209.)

†**Parasula** Mathews. New genus. Mathews, Austral Avian Record, II, Nos. 2–3, Oct. 23, 1913, p. 55 (type, *Sula dactylatra bedouti* Mathews). Includes the following North American species now in the genus *Sula*:

Parasula cyanops cyanops (Sundevall).

Parasula nebouxii (Milne-Edwards).

†**Morus** Vieillot, Analyse Nouv. Ornith. Élément., 1816, p. 63 (type, *Pelecanus bassanus* Linnæus). Recognized as a genus. (Cf. Mathews, List Birds Australia, 1913, p. 98; Birds Australia, IV, pt. 3, June 23, 1915, p. 217). The only North American species is now in the genus *Sula* and will therefore stand as:

Morus bassanus (Linnæus).

Phalacrocorax carbo (Linnæus) becomes **Phalacrocorax carbo americanus** (Reichenbach) (*Graculus americanus* Reichenbach, Novit. Synop. Avium, Natatores, Dec., 1850, p. [3], pl. CCCL [= Novit. LXXXVII = XXXV*]; North America), by recognition of the North American bird as a distinct subspecies. (Cf. Mathews, Birds Australia, IV, pt. 2, Feb. 17, 1915, p. 171.)

Fregata aquila (Linnæus) becomes **Fregata magnificens rothschildi** Mathews (*Fregata minor rothschildi* Mathews, Birds Australia, IV, pt. 3, June 23, 1915, p. 280; Aruba Island, Caribbean Sea), since *Fregata aquila* (Linnæus) proves to be extralimital. (Cf. Oberholser, The Auk, XXXIV, No. 4, Oct., 1917, pp. 468–469.)

†**Fregata minor palmerstoni** (Gmelin). *Pelecanus palmerstoni* Gmelin, Syst. Nat., I, ii, 1789, p. 573 (Palmerston Island, Pacific Ocean). Revived by Mathews (Austral Avian Record, III, No. 6, Dec. 19, 1914, p. 119; Birds Australia, IV, pt. 3, June 23, 1915, p. 280), for the bird of the central Pacific Ocean. Occurs also northeast to California. (Cf. Oberholser, The Auk, XXXIV, No. 4, Oct. 1917, p. 469.)

†**Anas rubripes tristis** Brewster, The Auk, XXVI, No. 2, April, 1909, p. 176 (new name for *Anas obscura* Gmelin). Reinstated as a subspecies. (Cf. Oberholser, The Auk, XXXIV, No. 2, April, 1917, pp. 192–194.) Range: northeastern United States to central Quebec and coast of Labrador; in winter south to the Gulf of Mexico.

†**Erismaturinæ**. Revived as a subfamily. (Cf. Mathews, Birds Australia, IV, pt. 1, Oct. 6, 1914, p. 8.) Includes the North American genera *Erismatura* Bonaparte and *Nomonyx* Ridgway.

†**Dendrocygninæ**. New subfamily. Shufeldt, Zool. Jahrb. (Abth. f. Systematik), XXXVIII, 1914, pp. 1–70, pls. I–XVI. Includes the genus *Dendrocygna* Swainson.

- Branta bernicla glaucogastra** (Brehm) becomes **Branta bernicla** (Linnæus); since *Branta bernicla glaucogastra* is only a dimorphic variety. Furthermore, *Bernicla glaucogaster* Brehm (Handb. Naturg. Vög. Deutschl., 1831, p. 849) applies to the form now called *Branta bernicla bernicla*; so that were the race now known as *Branta bernicla glaucogastra* recognizable as a subspecies it would have to stand as *Branta bernicla collaris* (Brehm) (*Bernicla collaris* Brehm, Handb. Naturg. Vög. Deutschl., 1831, p. 851; Coasts of Pomerania). (Cf. Hartert, Scottish Naturalist, No. 64, April, 1917, pp. 75-76.)
- Ardea herodias occidentalis** Audubon becomes **Ardea occidentalis** Audubon, because considered a distinct species. (Cf. Bartsch, The Auk, XXXIV, No. 1, Jan., 1917, p. 86.)
- †**Ardea herodias wardi** Ridgway. Reinstated as a tenable subspecies, because considered specifically distinct from *Ardea occidentalis* Audubon. (Cf. Todd, Annals Carnegie Mus., X, Jan., 1916, pp. 177-178; Bartsch, The Auk, XXXIV, No. 1, Jan., 1917, p. 86.)
- Egretta candidissima** (Gmelin) becomes **Egretta thula thula** (Molina). *Ardea thula* Molina, Sagg. Stor. Nat. Chili, 1782, p. 235 (Chile). The North American races will therefore need to be called:
- Egretta thula thula** (Molina).
- Egretta thula brewsteri** Thayer and Bangs.
- †**Limnogeranus** Sharpe, Bull. Brit. Orn. Club, I, No. VII, 1893, p. xxxvii (type, *Ardea americana* Linnæus). Recognized as a genus to include *Grus americana* (Linnæus). (Cf. Brasil, Genera Avium, XIX, 1913, p. 4), which therefore becomes:
- Limnogeranus americanus** (Linnæus).
- Grus mexicana** (Müller) becomes **Grus canadensis mexicana** (Müller). (Cf. Brasil, Genera Avium, XIX, 1913, p. 4.)
- †**Erolinæ**. Recognized as a subfamily of Scolopacidae for genera allied to *Pelidna*. (Cf. Lowe, Ibis, 1915, pp. 609-616.)
- †**Tringinæ**. Recognized as a subfamily of Scolopacidae for genera allied to *Totanus*. (Cf. Lowe, Ibis, 1915, pp. 609-616.)
- Pisobia damacensis** (Horsfield) becomes **Pisobia minutilla subminuta** (Middendorff) (*Tringa subminuta* Middendorff, Reis. Siber., Zool., 1851, p. 222; western slope of Stanovoi Mts., and Uda River, southeastern Siberia), since it is a subspecies of *Pisobia minutilla*, and since the name (*Pisobia damacensis*) Horsfield is a synonym of *Pisobia ruficollis* (Pallas) and thus unavailable for the bird now known as *Pisobia damacensis*. (Cf. Hartert, Novit. Zool., XXIII, 1916, pp. 92-93.)
- †**Erolia ferruginea chinensis** (Gray). *Tringa (Pelidna) chinensis* Gray, Zool. Miscell., 1831, p. 2 (China). Alaskan records of this species belong under this newly recognized subspecies. (Cf. Mathews, Birds of Australia, III, pt. 3, Aug. 18, 1913, pp. 266-268.)
- †**Vetola** Mathews. New genus. Mathews, Birds Australia, III, pt. 2, May 2, 1913, p. 191 (type, *Scolopax lapponica* Linnæus). Includes the following North American species now in the genus *Limosa*:

Vetola lapponica baueri (Naumann).

Vetola hæmastica (Linnæus).

Calidris leucophæa (Pallas) becomes **Calidris leucophæa rubida** (Gmelin) (*Charadrius rubidus* Gmelin, Syst. Nat., I, ii, 1789, p. 688; Hudson Bay, Canada), by recognition of a North American subspecies. (Cf. Mathews, Birds Australia, III, pt. 3, Aug. 18, 1913, p. 244.)

Totanus melanoleucus (Gmelin) becomes **Glottis melanoleuca** (Gmelin), because not generically separable from *Glottis nebularia*. (Cf. Mathews, Birds Australia, III, pt. 2, May 2, 1913, pp. 197-198; pt. 3, Aug. 18, 1913, p. 224.)

†**Iliornis** Kaup, Skizz. Entwickl.-Gesch. Eur. Thierw., 1829, p. 156 (type, *Totanus stagnatilis* Bechstein). Recognized as a genus. (Cf. Mathews, Birds Australia, III, pt. 2, May 2, 1913, pp. 197-199.) Includes one North American species now in the genus *Totanus*:

Iliornis flavipes (Gmelin).

†**Phæopus** Cuvier, Règne Animal, I, 1816, p. 485 (type, *Scolopax phæopus* Linnæus). Recognized as a genus. (Cf. Mathews, Birds Australia, III, pt. 2, May 2, 1913, pp. 167-169.) Includes the following North American species now in the genus *Numenius*:

Phæopus hudsonicus (Latham).

Phæopus borealis (Forster).

Phæopus phæopus phæopus (Linnæus).

Phæopus tahitiensis (Gmelin).

†**Numenius arquatus** (Linnæus). *Scolopax arquata* Linnæus, Syst. Nat., ed. 10, I, 1758, p. 145 (Sweden). Recorded from specimens taken on the eastern and western coasts of Greenland. (Cf. Helms, Dansk. Ornith. For. Tidssk., XI, Hæfte 3-4, Sept., 1917, p. 173.)

Ægialitis Boie becomes **Charadrius** Linnæus, because considered not generically separable. (Cf. Hartert and Jackson, Ibis, 1915, pp. 526-527.) Consequently the North American species of *Ægialitis* will now stand as:

Charadrius semipalmatus Bonaparte.

Charadrius hiaticula septentrionalis (Brehm).

Charadrius melodus Ord.

Ægialitis hiaticula major (Seeböhm) becomes **Charadrius hiaticula septentrionalis** Brehm. *Ægialitis septentrionalis* Brehm, Naturg. Vög. Deutschl., 1831, p. 548 (Iceland). (Cf. Schiøler, Dansk Ornith. For. Tidssk., IX, Hæfte 2-3, March, 1915, p. 181.)

†**Ægialeus** Reichenbach, Natürl. Syst. Vögel, 1852 (1853), p. XVIII (type, *Charadrius semipalmatus*). Recognized as a subgenus to include *Charadrius semipalmatus* Bonaparte. (Cf. Mathews, Birds Australia, III, pt. 2, May 2, 1913, p. 124.)

†**Cirrepidesmus** Bonaparte, Compt. Rend. Acad. Sci., XLIII, 1856, p. 417 (type, *Charadrius pyrrhothorax* Gould = *Charadrius atrifrons* Wagler). Recognized as a genus. (Cf. Mathews, Birds Australia,

III, pt. 1, April 2, 1913, pp. 81-84.) Its only North American species, now in the genus *Ægialitis*, is:

Cirrepidesmus mongolus (Pallas).

†**Leucopolius** Bonaparte, Compt. Rend. Acad. Sci., XLIII, 1856, p. 417 (type, *Charadrius marginatus* Vieillot). Recognized as a genus. (Cf. Mathews, Birds Australia, III, pt. 2, May 2, 1913, pp. 108-115). Includes only one North American species, which is now in the genus *Ægialitis*:

Leucopolius alexandrinus nivosus (Cassin).

Ægialitis nivosus (Cassin) becomes **Leucopolius alexandrinus nivosus** (Cassin), because only subspecifically different from *Leucopolius alexandrinus*. (Cf. Mathews, Birds Australia, III, pt. 2, May 2, 1913, p. 114; Hartert and Jackson, Ibis, 1915, pp. 527-528.)

†**Elseya** Mathews. New genus. Mathews, Birds Australia, III, pt. 2, May 2, 1913, p. 125 (type, *Charadrius melanops* Vieillot). Includes one North American species now in the genus *Ægialitis*:

Elseya dubia (Scopoli).

Jacana spinosa (Linnæus) becomes **Jacana spinosa gymnostoma** (Wagler) (*Parra gymnostoma* Wagler, Isis, 1832, p. 517; Mexico), by recognition of the Mexican bird as distinct from that of Central America. (Cf. Todd, Annals Carnegie Mus., X, Jan., 1916, pp. 219-220.)

†**Jacana spinosa violacea** (Cory). *Parra violacea* Cory, Bull. Nuttall Ornith. Club, VI, No. 3, July, 1881, p. 130 (Haiti). Recognized as a subspecies for the West Indian representatives of *Jacana spinosa*, with which Florida birds are identical. (Cf. Todd, Annals Carnegie Mus., X, Jan., 1916, pp. 217-220.)

†**Lophortyx californica catalinensis** Grinnell. *Lophortyx catalinensis* Grinnell, The Auk, XXIII, No. 3, July, 1906, p. 262 (Avalon, Santa Catalina Island, California). Reinstated as a subspecies. (Cf. Oberholser, The Auk, XXXIV, No. 2, April, 1917, p. 194.) Range: Santa Catalina Island, California.

†**Pediœetes phasianellus jamesi** Lincoln. New subspecies. Lincoln, Proc. Biol. Soc. Wash., XXX, May 23, 1917, p. 84 (three miles west of Castle Rock, Colo.). Range: foothills of Rocky Mountains from Colorado to Wyoming.

Circus hudsonius (Linnæus) becomes **Circus cyaneus hudsonius** (Linnæus). (Cf. Hartert, Vögel paläarkt. Fauna, Heft IX [Band II, Heft 3], Oct., 1914, p. 1142.)

Astur atricapillus (Wilson) is considered a subspecies of the European *Astur gentilis* (Linnæus) (= *Astur palumbarius* [Linnæus]). (Cf. Hartert, Vögel paläarkt. Fauna, Heft. IX [Band II, Heft 3], Oct., 1914, p. 1151.) The American races of this species will, therefore, now stand as:

Astur gentilis atricapillus (Wilson).

Astur gentilis striatulus Ridgway.

†**Buteo borealis umbrinus** Bangs, Proc. New Engl. Zoöl. Club, II, July 31, 1901, p. 68 (Myakka, Manatee Co., Florida). Revived as a subspecies. (Peters, Bull. Mus. Comp. Zoöl., LXI, No. 11, Oct., 1917, p. 400.) Range: Florida, Cuba, and Isle of Pines.

†**Buteo platypterus iowensis** B. H. Bailey. New subspecies. Bailey, The Auk, XXXIV, No. 1, Jan., 1917, p. 73 (Eagle Lake, Hancock County, Iowa.)

†**Tachytriorchis** Kaup. Recognized as a genus (Cf. Chubb, Birds Brit. Guiana, I, 1916, p. 231). Contains one North American species now in the genus *Buteo*:

Tachytriorchis albicaudatus sennetti (Allen).

†**Buteola** Bonaparte. Recognized as a genus. (Cf. Chubb, Birds Brit. Guiana, I, 1916, p. 236.) *Buteo brachyurus* Vieillot therefore becomes:

Buteola brachyura (Vieillot).

†**Haliaetus albicilla brooksi** Hume. *Haliaetus brooksi* Hume, Ibis, ser. 2, VI, No. XXIII, July, 1870, p. 438 (Upper India). Alaskan specimens of *Haliaetus albicilla* belong to this race. (Cf. Clark, Proc. U. S. Nat. Mus., XXXVIII, April 30, 1910, p. 57.)

†**Rhynchodon** Nitzsch. Recognized as a genus. (Cf. Mathews, List Birds Australia, 1913, p. 111; Birds Australia, V, pt. 2, Feb. 29, 1916, pp. 223-224.) Includes three North American forms now in the genus *Falco*:

Rhynchodon peregrinus peregrinus (Tunstall).

Rhynchodon peregrinus anatum (Bonaparte).

Rhynchodon peregrinus pealei (Ridgway).

†**Tinnunculus** Vieillot. Recognized as a genus. (Cf. Mathews, Birds Australia, V, pt. 2, Feb. 29, 1916, pp. 223-224.) Includes the following North American forms now in the genus *Falco*:

Tinnunculus columbarius columbarius (Linnæus).

Tinnunculus columbarius suckleyi (Ridgway).

Tinnunculus columbarius richardsonii (Ridgway).

Tinnunculus columbarius æsalon (Tunstall).

Falco æsalon Tunstall becomes **Tinnunculus columbarius æsalon** (Tunstall), by reason of subspecific relationship with *Tinnunculus columbarius*. (Cf. Hartert, Jourdain, Ticehurst and Witherby, Brit. Birds, IX, No. 1, June 1, 1915, pp. 5-6.)

†**Rhynchofalco** Ridgway. Recognized as a genus. (Cf. Mathews, Birds Australia, V, pt. 2, Feb. 29, 1916, p. 223.) Includes one species now in the genus *Falco*:

Rhynchofalco fuscocœrulescens septentrionalis (Todd).

Asio wilsonianus (Lesson) becomes **Asio otus wilsonianus** (Lesson). (Cf. Hartert, Vögel paläarkt. Fauna, Heft VIII, [Band II, Heft 2], August, 1913, p. 987.)

Speotyto cunicularia floridana Ridgway becomes **Speotyto floridana** Ridgway. (Cf. Ridgway, Bull. U. S. Nat. Mus., No. 50, pt. VI, 1914, pp. 814, 820.)

Glaucidium hoskinsi Brewster becomes **Glaucidium gnoma hoskinsii** Brewster. (Cf. Ridgway, Bull. U. S. Nat. Mus., No. 50, pt. VI, 1914, p. 788.)

†**Coccyzus minor nesiotus** (Cabanis and Heine). *Coccyzus nesiotus* Cabanis and Heine, Mus. Hein., IV, Heft 1, November, 1862, p. 78, footnote (Greater Antilles and Florida). Recorded from Florida. (Cf. Ridgway, Bull. U. S. Nat. Mus., No. 50, pt. VII, May 5, 1916, p. 27.)

†**Sphyrapicus thyroideus nataliæ** (Malherbe). *Picus nataliæ* Malherbe, Journ. f. Ornith., II, No. 8, March, 1854, p. 171 (Mexico). Revived as a subspecies. (Cf. Swarth, Condor, XIX, No. 2, March 15, 1917, p. 63). Range: Montana to Arizona, wintering south to Jalisco, Mexico.

†**Centurus uropygialis brewsteri** Ridgway, Proc. Biol. Soc. Wash., XXIV, Feb. 24, 1911, p. 32 (Santiago, southern Lower California). Recognized as a subspecies. (Cf. Ridgway, Bull. U. S. Nat. Mus., No. 50, pt. VI, 1914, p. 96). Range: southern Lower California.

Colaptes rufipileus Ridgway becomes **Colaptes cafer rufipileus** Ridgway. (Cf. Ridgway, Bull. U. S. Nat. Mus., No. 50, pt. VI, 1914, p. 37.)

Chordeiles virginianus (Gmelin) becomes **Chordeiles minor** (Forster) (*Caprimulgus minor* Forster, Cat. Anim. North Amer., 1771, p. 13; Virginia), since the latter has the same basis and is of earlier date. (Cf. Richmond, The Auk, XXXIV, No. 1, Jan. 1917, p. 88.) The North American races of *Chordeiles virginianus* therefore will stand as follows:

Chordeiles minor minor (Forster).

Chordeiles minor hesperis Grinnell.

Chordeiles minor sennetti Coues.

Chordeiles minor howelli Oberholser.

Chordeiles minor henryi Cassin.

Chordeiles minor aserriensis Cherrie.

Chordeiles minor chapmani Coues.

†**Myiarchus crinitus residuus** Howe, Contrib. North Amer. Ornith., I, May 21, 1902, p. 30 (Istokpoga Lake, Florida). Reinstated as a subspecies. (Cf. Oberholser, The Auk, XXXIV, No. 2, April, 1917, pp. 194-195.) Range: peninsula of Florida.

Aphelocoma woodhouseii (Baird) becomes **Aphelocoma californica woodhouseii** (Baird), because of intergradation with *Aphelocoma californica texana*. (Cf. Oberholser, Condor, XIX, No. 3, June 1, 1917, p. 94.)

Aphelocoma texana Ridgway becomes **Aphelocoma californica texana** Ridgway, because of intergradation with neighboring forms. (Cf. Oberholser, Condor, XIX, No. 3, June 1, 1917, p. 94.)

†**Aphelocoma californica immanis** Grinnell, The Auk, XVIII, No. 2, April, 1901, p. 188 (Seio, Willamette Valley, Oregon). Recognized as the subspecies breeding in northern California and western Oregon. (Cf. Oberholser, Condor, XIX, No. 3, June 1, 1917, pp. 94-95.)

- †**Perisoreus obscurus rathbuni** Oberholser. New subspecies. Oberholser, Proc. Biol. Soc. Wash., XXX, Dec. 1, 1917, p. 185 (Lake Crescent, Clallam Co., Wash.) Range: northwestern Washington.
- †**Corvus corax clarionensis** Rothschild and Hartert, Novit. Zool., IX, No. 2, July 25, 1902, p. 381 (Clarion Island, Revillagigedo Islands, Colima, Mex.). Recorded as the raven of the Santa Barbara Islands, Calif. (Cf. Bishop, Condor, XVII, No. 5, Oct. 10, 1915, p. 186).
- †**Molothrus ater artemisiæ** Grinnell, Univ. Calif. Publ. Zool., V, No. 5, Dec. 31, 1909, p. 276 (Quinn River Crossing, Humboldt County, Nevada). Reinstated as a subspecies. (Cf. Oberholser, The Auk, XXXIV, No. 3, July, 1917, pp. 327-328.) Range: western Canada, and western United States except southwestern border; south in winter to southern Mexico.
- Agelaius gubernator californicus** Nelson becomes **Agelaius phoeniceus californicus** Nelson, since intergradation shows it to be subspecifically connected with *Agelaius phoeniceus neutralis*. (Cf. Mailliard, Condor, XII, No. 2, March 25, 1910, pp. 63-70.)
- †**Sturnella neglecta confluenta** Rathbun. New subspecies. Rathbun, The Auk, XXXIV, No. 1, Jan., 1917, p. 68 (Seattle, Washington). Range: Pacific Coast region from southwestern British Columbia to northwestern Oregon.
- †**Hesperiphona vespertina brooksi** Grinnell. New subspecies. Grinnell, Condor, XIX, No. 1, Jan. 15, 1917, p. 20 (Okanagan, Brit. Col.). Range: southern British Columbia and Washington.
- †**Hesperiphona vespertina californica** Grinnell. New subspecies. Grinnell, Condor, XIX, No. 1, Jan. 15, 1917, p. 20 (Crane Flat, 6300 feet altitude, Mariposa County, Calif.). Range: California and Oregon.
- †**Hesperiphona vespertina warreni** Grinnell. New subspecies. Grinnell, Condor, XIX, No. 1, Jan. 15, 1917, p. 21 (Bear Creek, near Colorado Springs, Colo.). Range: Colorado, New Mexico, and Arizona.
- †**Pipilo enucleator kamtschathensis** (Dybowski). *Corythus enucleator kamtschathensis* Dybowski, Bull. Soc. Zool. France, VIII, 1883, p. 367 (Kamchatka). Recorded as North American from a specimen taken on St. George Island, Pribilof Islands, Alaska. (Cf. Riley, The Auk, XXXIV, No. 2, April, 1917, p. 210.)
- †**Carpodacus mexicanus obscurus** McCall. *Carpodacus obscurus* McCall, Proc. Acad. Nat. Sci. Phila., V, 1851, p. 220 (Santa Fe, New Mexico). Recognized as a subspecies. (Cf. Aiken, Colo. College Publ., (Gen. Ser., No. 75 and 76), Sci. Ser., XII, No. 13, pt. II, June, 1914, p. 549). Range: California to western New Mexico.
- †**Loxia curvirostra bendirei** Ridgway, Proc. Biol. Soc. Wash., II, April 28, 1884, p. 101 (Fort Klamath, Oregon). Reinstated as a subspecies. (Cf. Oberholser, The Auk, XXXIV, No. 3, July, 1917, pp. 328-329.) Range: western United States except the southwestern border.

Passer hostilis Kleinschmidt becomes **Passer domesticus hostilis** Kleinschmidt, because only subspecifically distinct from the bird of continental Europe. (Cf. Oberholser, *The Auk*, XXXIV, No. 3, July, 1917, p. 329.)

†**Nemospiza** Oberholser. New genus. Oberholser, *Ohio Journ. Science*, XVII, No. 8, June 2, 1917, p. 335 (type, *Emberiza henslowii* Audubon). Includes the following forms now in the genus *Passerherbulus*:

Nemospiza henslowii henslowii (Audubon).

Nemospiza henslowii occidentalis (Brewster).

†**Ammospiza** Oberholser, *Smiths. Misc. Coll.*, XLVIII, May 13, 1905, p. 68 (type, *Oriolus caudacutus* Gmelin). Reinstated as a genus. (Cf. Oberholser, *Ohio Journ. Science*, XVII, No. 8, June 2, 1917, p. 333.) Includes the following North American sparrows now in the genus *Passerherbulus*:

Ammospiza caudacuta caudacuta (Gmelin).

Ammospiza caudacuta subvirgata (Dwight).

Ammospiza caudacuta nelsoni (Allen).

Passerherbulus nelsoni nelsoni (Allen) becomes **Ammospiza caudacuta nelsoni** (Allen), by reason of intergradation with *Ammospiza caudacuta* (Gmelin). (Cf. Oberholser, *Ohio Journ. Science*, XVII, No. 8, June 2, 1917, p. 334.)

Passerherbulus nelsoni subvirgatus (Dwight) becomes **Ammospiza caudacuta subvirgata** (Dwight). (Cf. Oberholser, *Ohio Journ. Science*, XVII, No. 8, June 2, 1917, p. 334.)

†**Thryospiza** Oberholser. New genus. Oberholser, *Ohio Journ. Science*, XVII, No. 8, June 2, 1917, p. 332 (type, *Fringilla maritima* Wilson). Includes the following North American sparrows now in the genus *Passerherbulus*:

Thryospiza maritima maritima (Wilson).

Thryospiza maritima macgillivraii (Audubon).

Thryospiza maritima peninsulæ (Allen).

Thryospiza maritima sennetti (Allen).

Thryospiza maritima fisheri (Chapman).

Thryospiza nigrescens (Ridgway).

Zonotrichia leucophrys gambelii (Nuttall) becomes **Zonotrichia gambelii** (Nuttall), since it proves to be specifically distinct from *Zonotrichia leucophrys* (Forster). (Cf. Riley, *Canadian Alpine Journal*, special number, 1912 [Feb. 17, 1913], pp. 66-67).

Junco hyemalis connectens Coues becomes **Junco oreganus shufeldti** Coale (*Junco hyemalis shufeldti* Coale, *The Auk*, IV, No. 4, Oct., 1887, p. 330; Fort Wingate, New Mex.); also, by reason of the specific distinctness of *Junco oreganus* (Townsend) from *Junco hyemalis* (Linnaeus) (cf. Riley, *Canadian Alpine Journal*, special number, 1912 [Feb. 17, 1913], pp. 67-68), the juncos now considered subspecies of *Junco hyemalis* will stand as follows:

Junco hyemalis hyemalis (Linnaeus).

Junco hyemalis carolinensis Brewster.

Junco oreganus oreganus (Townsend).

Junco oreganus shufeldti Coale.

Junco oreganus thurberi Anthony.

Junco oreganus pinosus Loomis.

Junco oreganus montanus Ridgway.

Junco oreganus mearnsi Ridgway.

Junco oreganus annectens Baird.

Junco oreganus townsendi Anthony.

Junco phæonotus caniceps (Woodhouse) becomes **Junco caniceps** (Woodhouse), since it proves to be specifically distinct from *Junco phæonotus palliatus*. (Cf. Brooks, Condor, XVI, No. 3, May 15, 1914, p. 116; No. 4, July 25, 1914, p. 183.)

Melospiza melodia fallax (Baird) becomes **Melospiza melodia saltonis** Grinnell. *Melospiza melodia saltonis* Grinnell, Univ. Calif. Publ. Zool., V, No. 3, April 9, 1909, p. 268 (Salton Sea, one mile south-east of Mecca, Calif.). (Cf. Grinnell, Univ. Calif. Publ. Zool., XII, 1914, pp. 173-175).

Melospiza melodia montana Henshaw becomes **Melospiza melodia fallax** (Baird). (Cf. Grinnell, Univ. Calif. Publ. Zool., XII, 1914, pp. 173-174).

†**Melospiza melodia inexpectata** Riley, Proc. Biol. Soc. Wash., XXIV, Nov. 28, 1911, p. 234 (three miles east of Moose Lake, Brit. Col.). Reinstated as a subspecies. (Cf. Riley, Canadian Alpine Journal, special number, 1912 [Feb. 17, 1913], p. 68.)

Melospiza lincolni striata Brewster becomes **Melospiza lincolni gracilis** (Kittlitz). *Emberiza gracilis* Kittlitz (Denkwürd. Reis. Russ. Amer., I, 1858, p. 199; Sitka, Alaska) is the same bird subsequently described as *Melospiza lincolni striata* by Brewster. (Cf. Willett, Condor, XVI, No. 2, March 15, 1914, p. 87).

†**Passerella iliaca altivagans** Riley, Proc. Biol. Soc. Wash., XXIV, Nov. 28, 1911, p. 234 (Moose Branch of Smoky River, Alberta). Reinstated as a subspecies. (Cf. Riley, Canadian Alpine Journal, special number, 1912 [Feb. 17, 1913], p. 69.)

†**Passerella iliaca monoensis** Grinnell and Storer. New subspecies. Grinnell and Storer, Condor, XIX, No. 5, Sept. 25, 1917, p. 165 (Mono Lake Post Office, altitude 6500 feet, Mono County, Calif.). Range: Mono County, Calif.

†**Pipilo crissalis carolæ** McGregor. *Pipilo fuscus carolæ* McGregor, Bull. Cooper Ornith. Club, I, No. 1, 1899, p. 11 (Battle Creek, Shasta Co., Calif.). Reinstated as a valid subspecies. (Cf. Grinnell, Condor, XIV, No. 5, Sept. 28, 1912, p. 199.) Range: northern California and southwestern Oregon.

†**Zamelodia melanocephala capitalis** (Baird). [*Hedymeles melanocephalus*] var. *capitalis* Baird, in Baird, Brewer, and Ridgway's Hist.

North Amer. Birds, Land Birds, II, 1874, p. 70 (Columbia River, Oreg.). Revived as a subspecies. (Cf. Grinnell and Swarth, Univ. Calif. Publ. Zool., X, 1913, pp. 284-285; Bishop, Condor, XVII, No. 5, Oct. 10, 1915, p. 189.) Range: Pacific Coast region of the United States.

Hirundo erythrogastra Boddart becomes **Hirundo rustica erythrogastris** Boddart, by reason of subspecific relationship with *Hirundo rustica*. (Cf. Oberholser, Bull. U. S. Nat. Mus., No. 98, June 30, 1917, pp. 29-31.)

Bombycilla garrula (Linnæus) becomes, in so far as North America is concerned, **Bombycilla garrula pallidiceps** Reichenow, Ornith. Monatsber., XVI, No. 12, Dec., 1908, p. 191 (Shesly River, northern British Columbia); since North American birds are subspecifically different from those of the Old World. (Cf. Oberholser, The Auk, XXXIV, No. 3, July, 1917, p. 333.)

†**Lanius borealis invictus** Grinnell, Pacific Coast Avifauna, I, November 14, 1900, p. 54 (Kowak River, Alaska). Revived as a subspecies. (Cf. Bishop, Condor, XVII, No. 5, Oct. 10, 1915, p. 189). Range: western North America.

†**Vireo bellii arizonæ** Ridgway, Proc. Biol. Soc. Wash., XVI, Sept. 30, 1903, p. 108 (Tucson, Arizona). Recognized as a subspecies. (Cf. Grinnell, Univ. Calif. Publ. Zool., XII, 1914, pp. 189-190; Oberholser, The Auk, XXXIV, No. 3, July, 1917, p. 322.)

†**Vermivora celata orestera** Oberholser, The Auk, XXII, No. 3, July, 1905, p. 243 (Willis, northern New Mexico). Reinstated as a subspecies. (Cf. Oberholser, The Auk, XXXIV, No. 3, July, 1917, pp. 326-327). Range: western United States and southwestern Canada, except Pacific Coast district; in winter south to central and southern Mexico.

†**Dendroica cærulescens cairnsi** Coues. Reinstated as a subspecies. (Cf. Oberholser, The Auk, XXXIV, No. 3, July, 1917, pp. 325-326.)

†**Geothlypis trichas brachidactyla** (Swainson). *Trichas brachidactylus* Swainson, Anim. in Menag., 1838, p. 295 (northern provinces of United States). Reinstated as a subspecies. (Cf. Oberholser, The Auk, XXXIV, No. 3, July, 1917, p. 324.) Range: northeastern United States and southeastern Canada: south in winter to the West Indies, Costa Rica, and southern Mexico.

†**Geothlypis beldingi goldmani** Oberholser. New subspecies. Oberholser, Condor, XIX, No. 6, Dec. 7, 1917, p. 183 (San Ignacio, Lower Calif.). Range: central Lower California.

Anthus rubescens (Tunstall) becomes **Anthus spinoletta rubescens** (Tunstall). (Cf. Hartert et al., Hand-List Brit. Birds, 1912, p. 35.)

Thryomanes bewickii bairdi (Salvin and Godman) becomes **Thryomanes bewickii eremophilus** Oberholser, Proc. U. S. Nat. Mus., XXI, Nov. 19, 1898, p. 427 (Big Hatchet Mts., Grant Co., New Mex.).

(Cf. Swarth, Proc. Calif. Acad. Sci., ser. 4, VI, May 8, 1916, pp. 80-83; Grinnell, Univ. Calif. Publ. Zool., XII, 1914, pp. 209-210.)

†**Thryomanes bewickii drymæcus** Oberholser, Proc. U. S. Nat. Mus., XXI, Nov. 19, 1898, p. 437 (Baird, Shasta Co., Calif.). Revived as a subspecies. (Cf. Swarth, Proc. Calif. Acad. Sci., ser. 4, VI, May 8, 1916, p. 68.) Range: central part of northern two-thirds of California.

†**Thryomanes bewickii marinensis** Grinnell. *Thryomanes bewickii marinensis* Grinnell, Univ. Calif. Publ. Zool., V, No. 8, Feb. 21, 1910, p. 307 (Nicasio, Marin Co., Calif.). Revived as a subspecies. (Cf. Swarth, Proc. Calif. Acad. Sci., ser. 4, VI, May 8, 1916, p. 64.) Range: coast region of northern California.

†**Thryomanes bewickii nesophilus** Oberholser, Proc. U. S. Nat. Mus., XXI, Nov. 19, 1898, p. 442 (Santa Cruz Island, Calif.). Revived as a subspecies. (Cf. Swarth, Proc. Calif. Acad. Sci., ser. 4, VI, May 8, 1916, p. 78.) Range: Santa Cruz and Santa Rosa islands, California.

†**Thryomanes bewickii catalinæ** Grinnell. *Thryomanes bewickii catalinæ* Grinnell, Univ. Calif. Publ. Zool., V, No. 8, February 21, 1910, p. 308 (Avalon, Santa Catalina Island, California). Revived as a subspecies. (Cf. Swarth, Proc. Calif. Acad. Sci., ser. 4, VI, May 8, 1916, p. 78.) Range: Santa Catalina Island, California.

Thryomanes leucophrys (Anthony) becomes **Thryomanes bewickii leucophrys** (Anthony). (Cf. Swarth, Proc. Calif. Acad. Sci., ser. 4, VI, May 8, 1916, p. 79.)

†**Telmatodytes palustris æstuarinus** Swarth. New subspecies. Swarth, The Auk, XXXIV, No. 3, July, 1917, p. 310 (Grizzly Island, Solano Co., California). Range: central California; in winter to southwestern California.

†**Leptositta** Buturlin. New subgenus. Buturlin, Travaux Soc. Impér. Naturalistes Petrograd, XLIV, livr. 2, 1916, pp. 153, 156-157 (type, *Sitta leucopsis* Gould). Includes *Sitta carolinensis* Linnæus.

Sitta carolinensis carolinensis Latham becomes **Sitta carolinensis cookei** Oberholser, subsp. nov., The Auk, XXXIV, No. 2, April, 1917, p. 185 (Washington, D. C.). Range: northeastern United States and southeastern Canada.

Sitta carolinensis atkinsi Scott, becomes **Sitta carolinensis carolinensis** Latham, because South Carolina birds are subspecifically the same as those from Florida, the type locality of *Sitta carolinensis atkinsi*. (Cf. Oberholser, The Auk, XXXIV, No. 2, April, 1917, pp. 181-185.)

†**Micrositta** Buturlin. New subgenus. Buturlin, Travaux Soc. Impér. Naturalistes Petrograd, XLIV, livr. 2, 1916, pp. 153-156 (type, *Sitta villosa* Verreaux). To include all the North American nuthatches except *Sitta carolinensis*.

†**Bæolophus inornatus murinus** Ridgway, Proc. Biol. Soc. Wash.,

XVI, Sept. 30, 1903, p. 109 (Nachoguero Valley, northern Lower California). Reinstated as a subspecies. (Cf. Hellmayr, *Genera Avium*, XVIII, 1911, p. 29; Oberholser, *The Auk*, XXXIV, No. 3, July, 1917, pp. 322-323.) Range: northern Lower California and southwestern California.

Bæolophus wollweberi (Bonaparte) becomes **Bæolophus wollweberi annexus** (Cassin) (*Parus annexus* Cassin, *Proc. Acad. Nat. Sci. Phila.*, V, Oct., 1850, p. 103, pl. I; "Rio Grande in Texas"), since birds from the United States are subspecifically different from true *Bæolophus wollweberi*. (Cf. Oberholser, *The Auk*, XXXIV, No. 3, July, 1917, pp. 323-324.)

†**Penthestes hudsonicus columbianus** (Rhoads). *Parus hudsonicus columbianus* Rhoads, *The Auk*, X, No. 1, Jan., 1893, p. 23 (*Field, Brit. Col.*). Revived as a subspecies. (Cf. Hellmayr, *Genera Avium*, XVIII, 1911, p. 37.)

†**Psaltriparinæ**. Revived as a subfamily, to include, so far as North America is concerned, only the genus *Psaltriparus* Bonaparte. (Cf. Hellmayr, *Genera Avium*, XVIII, 1911, p. 44.)

†**Psaltriparus minimus saturatus** Ridgway, *Proc. Biol. Soc. Wash.*, XVI, Sept. 30, 1903, p. 109 (Mount Vernon, Wash.). Revived as a subspecies. (Cf. Hellmayr, *Genera Avium*, XVIII, 1911, p. 55.)

†**Remizinae**. Revived as a subfamily, to include, so far as North America is concerned, only the genus *Auriparus* Baird. (Cf. Hellmayr, *Genera Avium*, XVIII, 1911, p. 55.)

Regulus satrapa satrapa Lichtenstein becomes **Regulus regulus satrapa** Lichtenstein, by reason of individual intergradation with *Regulus regulus*. (Cf. Hellmayr, *Genera Avium*, XVII, 1911, p. 8.)

Regulus satrapa olivaceus Baird becomes **Regulus regulus olivaceus** Baird. (Cf. Hellmayr, *Genera Avium*, XVII, 1911, p. 8.)

†**Corthylio calendula cineraceus** (Grinnell). *Regulus calendula cineraceus* Grinnell, *Condor*, VI, No. 1, Jan. 15, 1904, p. 25 (Strain's Camp, Mt. Wilson, Los Angeles Co., Calif.). Reinstated as a subspecies. (Cf. Hellmayr, *Genera Avium*, XVII, 1911, p. 9.) Range: western United States to northern Mexico.

†**Polioptila plumbea margaritæ** Ridgway. *Polioptila margaritæ* Ridgway, *Bull. U. S. Nat. Mus.*, No. 50, 1904, p. 733 (Margarita Island, Lower Calif.). Revived as a subspecies of *Polioptila plumbea*. (Cf. Hellmayr, *Genera Avium*, XVII, 1911, p. 14.)

†**Planesticus merula merula** (Linnæus). *Turdus merula* Linnæus, *Syst. Nat.*, ed. 10, I, 1758, p. 170 (Sweden). Recorded from a specimen taken on the western coast of Greenland. (Cf. Schiøler, *Dansk Ornith. For. Tidssk.*, XI, Hæfte 3-4, Sept., 1917, p. 175.)

†**Planesticus migratorius caurinus** Grinnell, *Univ. Calif. Publ. Zool.*, V, No. 2, Feb. 18, 1909, p. 241 (Windfall Harbor, Admiralty Island, Alaska). Reinstated as a subspecies. (Cf. Oberholser, *The Auk*, XXXIV, No. 2, April, 1917, pp. 195-196.) Range: western Washington to southeastern Alaska.

- †**Sialia sialis episcopus** Oberholser. New subspecies. Oberholser, Proc. Biol. Soc. Wash., XXX, Feb. 21, 1917, p. 27 (Santa Engracia, Tamaulipas, Mexico). Range: northeastern Mexico to southern Texas.

REJECTIONS AND ELIMINATIONS.¹

- Brachyramphus craverii** (Salvadori) vs. **Brachyramphus hypoleucus** Xantus. Proposal to synonymize *Brachyramphus craverii* with *Brachyramphus hypoleucus* (cf. Beck, Proc. Calif. Acad. Sci., ser. 4, III, 1910, pp. 60-61) rejected (cf. Van Rossem, Condor, XVII, 1915, pp. 74-76).
- Cepphus snowi** Stejneger. The record from Alaska (cf. Reichenow, in Niedieck's Kreuzfahrten im Beringmeer, 1907, p. 250) is too doubtful for inclusion in the North American list. (Cf. Oberholser, The Auk, XXXIV, No. 2, April, 1917, p. 191.)
- Gelochelidon nilotica** (Gmelin) vs. **Gelochelidon anglica** (Montagu). Proposal to change name because of inadequacy of Gmelin's description (cf. B. O. U. Committee, List Brit. Birds, ed. 2, 1915, p. 394), rejected. (Cf. Hartert et al., British Birds, VIII, No. 12, May 1, 1915, p. 281.)
- Sterna fuscata** Linnaeus vs. **Sterna fuliginosa** Gmelin. Proposed change (cf. Hartert, Jourdain, Ticehurst, and Witherby, Hand-List Brit. Birds, 1912, p. 196) rejected. (Cf. Iredale, Ibis, 1914, p. 437; Hartert, British Birds, IX, No. 1, June 1, 1915, p. 10.)
- Puffinus kuhlii borealis** Cory vs. **Puffinus kuhlii flavirostris** (Gould). Proposed change of name (cf. G. H. Thayer, Science, new series, XLII, No. 1079, Sept. 3, 1915, pp. 308-310) rejected. (Cf. Stone, Science, new series, XLII, No. 1085, Oct. 15, 1915, p. 530.)
- Alphapuffinus** Mathews, Austral Avian Record, II, No. 5, Sept. 24, 1914, p. 110 (type, *Puffinus assimilis* Gould). Not separable from *Puffinus* Brisson. (Cf. Oberholser, The Auk, XXXIV, No. 4, Oct., 1917, p. 472.)
- Puffinus assimilis** Gould vs. **Puffinus assimilis baroli** Bonaparte. (Compt. Rend. Acad. Sci., XLII, 1856, p. 769) (cf. Mathews, Birds Australia, II, pt. 1, May 30, 1912, pp. 67 to 69). Change rejected. (Cf. Hartert, British Birds, VIII, No. 12, May 1, 1915, pp. 282-283.)
- Puffinus couesi** Mathews, Birds Australia, II, pt. 1, May 30, 1912, p. 67. An unnecessary new name for *Puffinus opisthomelas* Godman since this is the same as *Puffinus opisthomelas* Coues. (Cf. Oberholser, The Auk, XXXIV, No. 4, October, 1917, p. 473.)
- Puffinus auricularis** Townsend vs. **Puffinus opisthomelas** Coues (cf. Mathews, Birds Australia, II, pt. 1, May 30, 1912, pp. 65-67). Change rejected, since both these names do not refer to the same

¹ Eliminations of forms already in the A. O. U. Check-List, the Sixteenth Supplement, the First Annual List or the Second Annual List, are designated by an asterisk.

- species. (Cf. Oberholser, *The Auk*, XXXIV, No. 4, Oct., 1917, p. 473.)
- Neonectris** Mathews, *Austral Avian Record*, II, No. 1, Aug. 2, 1913, p. 12 (type, *Puffinus breviceaudus* Gould). Originally proposed as a genus to include *Puffinus tenuirostris* and *Puffinus griseus*. Now considered neither generically nor subgenerically separable from *Puffinus* Brisson. (Cf. Oberholser, *The Auk*, XXXIV, No. 4, Oct., 1917, p. 472.)
- Bannermania** Mathews and Iredale, *Ibis*, ser. 10, III, No. 3, July 2, 1915, p. 578 (type, *Thalassidroma hornbyi* Gray), is not generically separable from *Oceanodroma* Reichenbach. (Cf. Oberholser, *The Auk*, XXXIV, No. 4, Oct., 1917, pp. 465-466.)
- Cymochorea** Coues. Proposed recognition as a genus (cf. Mathews and Iredale, *Ibis*, ser. 10, III, No. 3, July, 1915, pp. 574-581) rejected. (Cf. Oberholser, *The Auk*, XXXIV, No. 4, Oct., 1917, p. 467.)
- Sula dactylatra californica** Rothschild, *Bull. Brit. Ornith. Club*, XXXV, No. CCIII, Jan. 27, 1915, p. 43 (San Benedicto Island, Revillagigedo Islands, western Mexico). Alleged occurrence in California not substantiated. (Cf. Oberholser, *The Auk*, XXXIV, No. 4, Oct., 1917, pp. 467-468.)
- Hemisula** Mathews, *Austral Avian Record*, II, Nos. 2-3, Oct. 23, 1913, p. 55 (type, *Sula leucogaster rogersi* Mathews) = *Sula* Brisson. (Cf. Mathews, *Birds Australia*, IV, pt. 3, June 23, 1915, p. 230.)
- Anas fulvigula maculosa** Sennett vs. **Anas fulvigula** Ridgway. Proposed elimination of *Anas fulvigula maculosa* (cf. Phillips, *The Auk*, No. 3, July, 1912, pp. 297-299) rejected. (Cf. Phillips, *The Auk*, XXXIII, No. 4, Oct., 1916, p. 432-433.)
- ***Dendrocygna viduata** (Linnaeus). The recent record from New Jersey (cf. Grinnell, *The Auk*, XXX, No. 1, Jan., 1913, p. 110) is probably based on a bird escaped from captivity. (Cf. Oberholser, *The Auk*, XXXIV, No. 2, April, 1917, p. 192.)
- ***Ardea herodias oligista** Oberholser (*Proc. U. S. Nat. Mus.*, XLIII, Dec. 12, 1912, p. 531; San Clemente Island, Calif.) = *Ardea herodias hyperonca* Oberholser. (Cf. Swarth, *Condor*, XV, No. 1, Feb. 8, 1913, p. 50; Howell, *Pac. Coast Avifauna*, No. 12, June 30, 1917, pp. 43-44.)
- ***Rallus longirostris caribæus** Ridgway = *Rallus crepitans saturatus* Ridgway, in so far as North American records are concerned. (Cf. Simmons, *The Auk*, XXXI, No. 3, July, 1914, pp. 363-365; 384.)
- Rhyacophilus glareola** (Linnaeus) vs. **Rhyacophilus glareola affinis** (Horsfield) (cf. Mathews, *Birds Australia*, III, pt. 3, Aug. 18, 1913, pp. 230-232). Change rejected. (Cf. Thayer and Bangs, *Proc. New Engl. Zool. Club*, V, April 9, 1914, pp. 19-20.)
- Falco æsalon** Tunstall vs. **Falco regulus** Pallas. Proposed change of name (cf. Hartert et al., *Hand-List Brit. Birds*, 1912, p. 112) rejected. (Cf. Hartert et al., *British Birds*, IX, No. 1, June 1, 1915, p. 5.)

Scotiaptex Swainson vs. **Strix** Linnæus. Proposed elimination of *Scotiaptex* as a genus (cf. Hartert, Vögel paläarkt. Fauna, Heft VIII [Band II, Heft 2], August, 1913, pp. 1013-1017) rejected. (Cf. Ridgway, Bull. U. S. Nat. Mus., No. 50, pt. VI, 1914, pp. 620, 634-639.)

***Scotiaptex nebulosa lapponica** (Thunberg) = *Scotiaptex nebulosa nebulosa* (Forster), in so far as North American records are concerned. (Cf. Ridgway, Bull. U. S. Nat. Mus., No. 50, pt. VI, 1914, p. 635.)

Cryptoglaux funerea richardsoni (Bonaparte) vs. **Cryptoglaux tengmalmi richardsoni** (cf. Ridgway, Bull. U. S. Nat. Mus., No. 50, pt. VI, 1914, pp. 623, 624). Change of name rejected. (Cf. Lönnberg, Ibis, 1913, pp. 398-400.)

Otus asio gilmani Swarth vs. **Otus asio cineraceus** (Ridgway). Proposed elimination of the former as inseparable from *Otus asio cineraceus* (Ridgway) (cf. Ridgway, Bull. U. S. Nat. Mus., No. 50, pt. VI, 1914, p. 702) rejected. (Cf. Swarth, Condor, XVIII, No. 5, Sept. 18, 1916, pp. 163-165.)

Bubo virginianus subarcticus (Hoy) vs. **Bubo virginianus wapacuthu** (Gmelin) (cf. Ridgway, Bull. U. S. Nat. Mus., No. 50, pt. VI, 1914, p. 751). Change of name rejected. (Cf. Oberholser, The Auk, XXXIV, Oct., 1917, pp. 469-470.)

Sphyrapicus ruber (Gmelin) vs. **Sphyrapicus varius ruber** (Gmelin). Proposed reduction to a subspecies (cf. Swarth, Univ. Calif. Publ. Zool., X, 1912, pp. 34, 38) rejected. (Cf. Ridgway, Bull. U. S. Nat. Mus., No. 50, part VI, 1914, p. 282.)

***Aphelocoma cyanotis** Ridgway. All North American records refer to *Aphelocoma californica texana* Ridgway. (Cf. Oberholser, Condor, XIX, No. 3, June 1, 1917, p. 94.)

Astragalinus psaltria mexicanus (Swainson). Revival as a subspecies (cf. Aiken, Colo. College Publ., Sci. Ser., XII, No. 13, pt. II, June, 1914, pp. 557-559) rejected, because regarded identical with *Astragalinus psaltria psaltria*. (Cf. Grinnell, Condor, XVI, No. 6, Nov. 25, 1914, p. 265).

Astragalinus psaltria arizonæ (Coues). Revival as a subspecies (cf. Aiken, Colo. College Publ., Sci. Ser., XII, No. 13, pt. II, June, 1914, pp. 557-559) rejected, because regarded identical with *Astragalinus psaltria psaltria*. (Cf. Grinnell, Condor, XVI, No. 6, Nov. 25, 1914, p. 265).

***Hirundo erythrogastra palmeri** Grinnell = *Hirundo rustica erythrogastris* Boddært. (Cf. Oberholser, Bull. U. S. Nat. Mus., No. 98, June 30, 1917, p. 29.)

Sitta atkinsi litorea Maynard, Records of Walks and Talks with Nature, VIII, No. 1, Jan. 12, 1916 [Jan. 13, 1916], p. 5, pl. I (New River, N. C.) = *Sitta carolinensis carolinensis* Latham. (Cf. Oberholser, The Auk, XXXIV, No. 2, April, 1917, pp. 182-184.)

GENERAL NOTES.

Horned Grebe Rising from the Ground.—The possibility of any grebe rising from a hard, level surface seems so generally doubted, that the following account (taken from my field notebook) of an actual instance appears to me worthy of permanent record. Of course it does not prove that any other species of the family can do so. Even Holbøll's Grebe, of the same genus, may not have the ability, as Mr. F. Seymour Hersey tells me that it is much more loth to rise from the water than its smaller brother; he has approached by boat many of each species; and while the Horned Grebe has frequently flown away, Holbøll's has invariably dived. There are also published stories of Holbøll's and other species that were unable to leave after coming down onto a frozen lake or on the land.

On October 28, 1917, at Long Beach, Nassau County, Long Island, N. Y., Mr. Walter Granger and I met a gunner who had just shot a Horned Grebe (*Colymbus auritus*). A little further on we found another Horned Grebe sitting on the beach, on the hard part but well away from the water, in a horizontal, swimming position, not upright like an auk. On our approach it raised itself, and when we were within a few feet uttered a little, whining, protesting note, then scuttled rapidly away several yards, into the rather brisk wind and away from the water. On our second approach it repeated the performance, but kept on going, and rose from the hard beach into the wind. Flying strongly and swiftly, though it seemed to wobble somewhat, it made a circle to the right several hundred yards in diameter, turned and again with the wind came down onto the hard sand on the inner side of the bar. It landed on a long slant but so hard that it rolled over and over, until it finally sat up and settled itself comfortably. It was still there when we passed again about two and a half hours later.—CHARLES H. ROGERS, *American Museum of Natural History, New York City.*

Pied-billed Grebe (*Podilymbus podiceps*) in Chester Co., Pa., in Summer.—Opposite my home at Cheyney, Chester Co., Pa., is an extensive calamus marsh, with a public road running along the edge of it. On June 13, 1917, a man passing along this road found an adult male Pied-billed Grebe, which had evidently just been killed by a passing automobile. The specimen was given to me and is now in the collection of the Academy of Natural Sciences of Philadelphia. From the date and the condition of the bird there seems little doubt but that it was nesting.—SPENCER TROTTER, M. D., *Swarthmore College, Pa.*

Breeding of the Pied-billed Grebe (*Podilymbus podiceps*) near State College, Center Co., Pa.—On May 14, 1917, I found on a small pond at Scotia six miles from State College, Pa., a nest of the Pied-billed Grebe that held six slightly incubated eggs. The pond was open except at one

end where there was a short stretch of alders and scrub oak killed by a rise of the water at one time and it was at the edge of this slight protection that the nest was built. It was the usual mass of decaying vegetation, reeds, grasses, etc., and was attached to several of the alders as the water under it was two feet deep. When found, the eggs were entirely covered from sight and no birds were seen, although one bird was heard calling nearby. I had always regarded this species here as a migrant only and would never have searched for a nest had I not been attracted by the suspicious fact that this pair of birds could always be found at this particular part of the pond. They were first seen the 17th of April and when the first week in May passed and they were still daily in evidence, their presence could no longer be casually overlooked. This is, I believe, the first definite breeding record for this species in the State.—THOS. D. BURLEIGH, *State College, Pa.*

A Red-throated Loon on Chestnut Hill Reservoir, Boston, Mass.—
In the early afternoon of February 7, 1918, while I was observing the ducks on Chestnut Hill reservoir, a bird came on the wing from the westward which upon alighting on the water was seen to be a Red-throated Loon (*Gavia stellata*). After taking its bearings for a few minutes, it began to swim and dive in the ample area of open water about the intake, which even during the very severe weather of the present winter has been of considerable extent, affording a wintering place for Mergansers, Black Ducks, a few Golden-eyes, and recently a Ruddy Duck. At the time the sky was clouded, wind northeast, and the temperature about 24°. Two days later Mr. Barron Brainerd with Mr. Talbot found this loon still present. But when I visited the reservoir on the 11th, it was not there. The area of open water had been diminished almost half by a formation of thin ice around its borders and had become, perhaps, inadequate to the loon's sense of sufficiency. I am informed that Mr. Talbot noted the absence of this loon on the 10th.

This was my first record of a Red-throated Loon on a pond, lake, or reservoir. I find that Mr. William Brewster reports but one occurrence in his 'Birds of the Cambridge Region' [1906], that of a young male shot in Fresh Pond by Mr. Ruthven Deane on October 21, 1871. The species is not uncommon in winter along the seacoast of New England, and in its fall migration is rather common. Dr. C. H. Townsend in his 'Birds of Essex County' [1905] states, "The Red-throated Diver is a lover of salt water, very rarely, in Essex County, entering the fresh-water ponds and rivers." Dr. J. C. Philips in an article on 'Ten Years of Observation on the Migration of Anatidæ at Wenham Lake, Massachusetts,' (*Auk*, vol. XXVIII, April, 1911, p. 197) says concerning the Red-throated Loon, "Rare in the pond. The only specimen in my collection is a female marked Wenham Lake, October, 1906." Dr. Glover M. Allen in 'Birds of New Hampshire' [1903] gives two records of individuals taken in the interior of the State in the autumns of 1876 and 1886 respectively, and

states that "Mr. G. H. Thayer has noted it as a rare autumn visitant to Dublin Pond." Mr. Thayer (Auk, Vol. XXI, October, 1904, p. 493) gives a record of two seen in Dublin Pond "during a long and heavy north-easterly storm which ended on October 12 or 13, 1903." Mr. Ora W. Knight in his 'Birds of Maine [1908] says, "Occasional specimens are reported about the ponds and lakes in fall, or more rarely in spring." Messrs. Sage, Bishop and Bliss in 'Birds of Connecticut' [1913] state concerning the species, "very rare inland," and then give two autumn records.

So it would appear that in New England the Red-throated Loon's appearances inland on bodies of fresh water have been rare, and that these appearances have all been in the autumn, with the exception of Mr. Knight's testimony of occurrences in Maine under the expression "more rarely in spring." The Chestnut Hill reservoir occurrence in February, therefore, seems to stand by itself as an incident not duplicated in New England, so far as an examination of records show.—HORACE W. WRIGHT, *Boston, Mass.*

The Ivory Gull (*Pagophila alba*) at Portland, Maine.—On January 4, 1918, Mr. Walter H. Rich of this city informed me that he had on this day observed an Ivory Gull off Commercial wharf well up Portland Harbor; the following day, January 5, with Mr. Rich I visited the water front, and we soon had the bird under observation, watching it for an hour. Once it came within twenty yards of the end of the wharf, and lighted on a large ice cake, affording a perfect opportunity for full identification.

The deeply incised webs of the black feet were distinctly visible and were very noticeable. It was an immature bird and at this close range the brownish tips of the feathers of the wings and an imperfect tail band were distinct, though they were not visible when the bird was in the distance where we mostly saw it. The loreal region was so thickly spotted that in the distance the gull appeared to be wearing a dark mask, combined with an otherwise snowy white plumage. The snowy whiteness of its plumage, was always noticeably different from any other gull in the harbor, which contained at the time an abundance of *Larus argentatus* in all plumages, *Larus kumleni* and *Larus leucopterus*. Its habits and flight also differed distinctly: it was much more restless, now alighting on the ice, either to remain at rest for a few minutes, or to feed at the water's edge, and then away to search the edge of the ice field or to feed near some of the docks. It seemed to pay little or no attention to the other gulls, or their feeding. On the ice it ran rapidly, suggesting the action of a large plover. Its restlessness and independent action suggested to me the action of *Larus atricilla* as it appears in the company of *Larus argentatus*. Its dashing flight seemed more like that of a Jaeger than that of a gull. The wing was used at full extent with very little flexure at humero-radial and carpal joints and was broad and wedge shaped in comparison with the narrower wing of *Larus*

argentatus. It was seen for the last time January 7 by Mr. Rich though daily watch has been kept to the present time, February 22, 1918.

During the period that the bird was seen the mercury was hardly rising above 0° Fah. and the harbor and bay was a solid field of ice except as broken by the ever bushy tugs laboring to keep an open channel.

The only other record of this Gull in Maine that I have found is of a specimen in the United States National Museum, taken in "Penobscot Bay, Me., December,¹ 1894" though three examples have been reported from Grand Menan, N. B., just over the state boundary, two by George A. Boardman,² and one by Allan L. Moses.³ Mr. Moses records his specimen as seen December 31, 1908, but dates are not given for the Boardman specimens.—ARTHUR H. NORTON, *Museum of Natural History, Portland, Me.*

Glaucous Gull (*Larus hyperboreus*) at Philadelphia.—On January 1, 1918, Mr. Richard Erskine saw one of these birds while crossing the Delaware River on a ferry boat from Camden, N. J. He was struck with the marked difference in its appearance from any of the Herring Gulls, with the plumages of which he was quite familiar, and suspected its identity. Consulting Chapman's 'Handbook' and the plate in Eaton's 'Birds of New York' he was convinced of the accuracy of his identification, and having a still closer view of the bird on January 4 all possibility of a doubt was dismissed, while a subsequent examination of specimens in the collection of the Academy of Natural Sciences, only served to confirm his opinion.

This is the first record for eastern Pennsylvania so far as I am aware.—WITMER STONE, *Acad. Nat. Sci., Philadelphia.*

***Pterodroma gularis* in North America.**—Through the courtesy of the Biological Survey and with thanks to Dr. Harry C. Oberholser, who called this matter to my attention and generously turned it over to me for publication, I am enabled to make an interesting addition to the list of North American birds.

A North American specimen of *Pterodroma gularis* (Peale) has for a number of years been in the collection of the Biological Survey in the United States National Museum, and it seems worth while now to put it on record as such. It is No. 230820 of the United States National Museum collection, and was found on the beach at the eastern base of Frosty Peak, Alaska Peninsula, August 6, 1911, by Mr. Alexander Wetmore. This bird, together with another taken by our expedition at the entrance to Kiska Harbor, in the Aleutian Islands, Alaska, form the basis of the recent record of *Æstrelata fisheri* from Alaska (Smithson. Miscell. Coll., Vol. 56, No. 32, February 12, 1912, p. 10). Both these birds have been carefully

¹ 1915: Cooke, U. S. Dept. Agric. Bull. 292, p. 16.

² 1897: Chamberlain, Nutt. Man. ii: 245.

³ 1908: Moses, Journ. Maine Orn. Soc. viii: 15.

compared with the types of both *Pterodroma fisheri* (Ridgway) and *Pterodroma gularis* (Peale), as well as with other pertinent material. Whatever the ultimate disposition of the apparently unique type of *Pterodroma fisheri*, it is certain that the two specimens from Alaska here mentioned are properly referable to *Pterodroma gularis*. They are, it is true, lighter and more greyish than the type of *Pterodroma gularis*, but not more so than other recently collected specimens of this species, so that the differences exhibited are surely not more than individual variations. In accordance with this identification, *Pterodroma gularis* should be added to the list of North American birds. I have long suspected this, but have only recently verified the identification through Dr. Oberholser.

The use of the generic name *Pterodroma* Bonaparte (1856) instead of *Æstelata* Bonaparte (1857) has already been explained by Dr. E. Hartert (Handlist Brit. Birds, 1912, p. 154), the date (1855) usually cited for the latter proving to be wrong.—A. C. BENT, *Taunton, Mass.*

Blue Geese on Long Island.—Long Island is quite out of the usual range of the Blue Goose (*Chen caerulescens*), and I recall but one record for that locality — 1893 — when Mr. Wm. Dutcher stated that there was one specimen in the collection of the Long Island Historical Society, killed many years ago by Col. Nicholas Pike. That bird was taken on Shinnecock Bay, but the date does not seem to be known. The record appears in 'The Auk,' Vol. X, p. 270.

Within the last few years at least two separate captures of Blue Geese have been made on Long Island, by Captain John H. Prentice, 307th Infantry, while shooting geese over live Canada Geese decoys. Capt. Prentice, at Montauk, L. I., in November, 1911, killed a single Blue Goose, which came in over his decoys. The following year (1912) in the month of October, five Blue Geese came in, and all were secured. In the captures of each year one or more of these birds was sent to the taxidermist Thomas Rowland, in Sixth Avenue, New York, where I saw them. One of them was apparently a bird of the year without any white patches. Two of the specimens were preserved and are now mounted in Capt. Prentice's house at Montauk.

The line of migration of the Blue Geese is usually given as through the Mississippi Valley, and I believe that, in these days, stragglers in other regions are seldom encountered.—GEO. BIRD GRINNELL, *New York City.*

The Whistling Swan at Cap St. Ignace, P. Q.—On October 11 last, a flock of seven swans (*Olor columbianus*) was seen on the beach of the south side of the river St. Lawrence at Cap St. Ignace, about forty miles below Quebec. All these birds have been shot and six of them have been sent to me in the flesh to be stuffed. It is the second record of the presence of the bird in our province, that I know of. They were quite tame and seemed to be starved so that the hunters easily shot them.—C. E. DIONNE, *Quebec, Canada.*

Solitary Sandpiper (*Tringa solitaria solitaria*) in New Mexico.—A single specimen of the eastern form of the Solitary Sandpiper has been for some time in the collection of the Biological Survey, identified as *Tringa solitaria cinnamomea*. A recent examination of the specimen, however, shows that it is certainly a typical example of the eastern race, *Tringa solitaria solitaria*. It is a male in juvenal plumage, taken at Guadalupita, New Mexico, at an altitude of 6800 feet, on August 7, 1903, by Mr. A. E. Weller, and it now bears the number 193391 in the United States National Museum. It constitutes the only authentic record for New Mexico.—HARRY C. OBERHOLSER, *Washington, D. C.*

King Rail (*Rallus elegans*) in Massachusetts.—On September 15, 1917, on the edge of a fresh water pond, at Haverhill, Mass., I saw a rail which I supposed was this species, but I was unable to secure it. Just a month later in the same spot I again saw it, and succeeded in shooting it. The specimen was identified from a photograph, by Mr. E. H. Forbush and Mr. Walter Rich, and by Mr. M. Abbott Frazar, the taxidermist who mounted it.—CHARLES B. MORSS, *Haverhill, Mass.*

Short-eared Owl (*Asio flammeus*) **Eating Birds.**—The old duck hunters of Ashbridge's Marsh, Toronto, called this species "Snipe Owl." They claimed that its appearance in the fall was coincident with that of the Wilson's Snipe. This was true, at least, in the fall of 1909 when both species arrived at the same time.

Between September 28 and October 16, 1909, I spent several days collecting in a small dry meadow, on the south shore of Ashbridge's Marsh. Short-eared Owls were more numerous than usual and were apparently feeding entirely on small birds. Four stomachs examined contained feathers and bird bones exclusively. In a small tract of dry grassy meadow, roughly estimated at fifty acres, I found feathers of the following species, marking the spot where they had been eaten by the owls; one Hermit Thrush, one Sora, three Yellow-bellied Sapsuckers, one Slate-colored Junco, one White-crowned Sparrow, and eighteen others, of which there were not enough feathers left to identify the species.

During April and the early part of May of the following spring, the owls were again plentiful, preying on the hosts of migrants, that rested along the sandbar, after crossing Lake Ontario. With one exception all the castings examined contained the bones and feathers of small birds. This meadow was swarming with voles, but only one pellet, of the many examined was composed of the fur and bones of voles.—J. A. MUNRO, *Okanagan Landing, British Columbia.*

Downy Woodpecker in Colorado.—I have a specimen of the Downy Woodpecker (*Dryobates p. medianus*) taken on Clear Creek, near Golden, Colo., on February 25, 1917. The bird is a female and as the white spottings on the lesser wing coverts are somewhat restricted, I hesitated there-

fore before classifying it as this variety. I referred it however, to Mr. F. C. Lincoln of the Colorado Museum of Natural History, who advised that although not quite typical, its small size and general characters, unquestionably refer it to *medianus*.—E. RETT, *Denver, Colo.*

The Starling in Montgomery, Alabama.—A few evenings ago I was called to my telephone to identify a bird which had been blown into the yard of a farmhouse eight miles southeast of the city. Not being able to make a decision from the description given me, I suggested that the specimen be sent to my home. This was done the following day, and I immediately identified it as the European Starling (*Sturnus vulgaris*), though I had never before seen one. Several others who have seen it, have verified my opinion.

The bird had been blown against the barn of Mrs. Frances Hagan of this county during a rainstorm on the night of January 14 and was found dead the following morning. It is apparently a full grown male. The plumage has a tendency in color toward green rather than purple but the upper neck and back are decidedly of the later color and the tan yellow spots are decidedly lanceolate. I have identified it as a male in winter plumage.

The specimen has been mounted and presented to the Museum of the Alabama State Department of Archives and History.—PETER A. BRANNON, *Montgomery, Ala.*

The Starling (*Sturnus vulgaris*) at Portland, Maine.—Last summer several reports came to hand that the Starling was breeding at Stroudwater, a suburb of Portland. On tracing these reports it was found that they all emanated from one source, Mr. George Parker, a student in the Deering High School, and an earnest student of birds. On July 15, 1917, I visited Mr. Parker at his home in Stroudwater and he took me to a nearby orchard where we quickly found the Starlings in several small groups. Several of the groups flew to a point in the orchard and then across a field to another part of it and we were able to count nineteen, though there were undoubtedly more in the vicinity. Many of these were in brown immature plumage giving support to Mr. Parker's belief that four pairs had bred in the vicinity. His first observation (which he had noted in a diary) was December 27, 1916, of a group of five.

Though this is not the first time that the Starling has appeared in Maine in recent years, it is believed that this record may be of service in fixing the time of the permanent arrival of the bird in Portland.

One specimen from the colony has been preserved in the collection of the Portland Society of Natural History.—ARTHUR H. NORTON, *Museum of Natural History, Portland, Me.*

Yellow-headed Blackbird at Ipswich, Mass.—At Ipswich, Mass., September 17, 1917, I had under observation for about half an hour, a Yellow-headed Blackbird (*Xanthocephalus xanthocephalus*). It was in the plumage of the female.—FRANCIS BEACH WHITE, *Concord, N. H.*

Nesting of the Red Crossbill (*Loxia curvirostra minor*) in Essex County, Massachusetts.— Our part of Cambridge is not without keen-eyed lads who devote spare hours to watching birds. To have them call on me every now and then with eager questioning or fresh report concerning things of local interest, is always pleasing and may also be instructive — as happened only the other day when Lovell Thompson and Charles F. Walcott came, bringing a nest of the Red Crossbill obtained by them last spring at Marblehead. Just how it was found and taken is explained by the following statement, written out, at my suggestion, by Lovell.

“During the winter of 1916–1917 I visited Marblehead, Mass.; with my friend Charles Walcott, several times. Each time we saw a flock of Red Crossbills there. On April 22, 1917, we noticed two in pitch pines near a house. Looking closer we found their nest, on a pine branch about eighteen feet above the ground. The male Crossbill flew from the tree but when I climbed it the female was on the nest and I got my hand within two feet of her before she left it to fly away. There were two eggs in it, both whitish with some dark markings. About a month later we visited the place again. There was then nothing to be seen of the Crossbills and only one broken egg shell remained in the nest which we took and have since given to Mr. Brewster.”

The nest above mentioned somewhat resembles that of a Song Sparrow, being similarly bulky and deep-cupped, with thick walls mostly composed of bleached grass-blades and weed stalks. But it has also a bristling outer fringe of stiff twigs six to ten inches long, such as no Song Sparrow would thus be likely to employ. Moreover its neat lining of fine, soft grasses includes a few Crossbill feathers at least one of which, brick red in color, must have come from an adult male bird. Their presence affords, of course, convincing evidence as to the original ownership of the nest, thereby, indeed, it is “self-identified.”

Two nests of the Red Crossbills in my collection from New Brunswick, both accompanied by sets of eggs and skins of parent birds, are, unfortunately, not well enough preserved to afford satisfactory comparison with the Marblehead specimen. From it they differ conspicuously in general coloring because abundantly garnished with grey-green *Usnea* moss of which it has none. They are also less shapely and almost devoid of coarse outer twigs but as a few of these remain in place their comparative absence may have resulted from careless handling on the part of the collector. In other respects all three nests seem essentially alike — at least as regards their general plan of construction.

In these days of innumerable bird watchers and voluminous bird literature it is difficult to make sure as to whether this or that is, or is not known and recorded. But to the best of my recollection and belief no nest of a Crossbill has ever before been found anywhere in eastern Massachusetts. Hence my boy friends are entitled to much credit for discovering the Marblehead one, while I am grateful to them both for so generously contributing it to my collection.— WILLIAM BREWSTER, *Cambridge, Mass.*

The Song of Bachman's Sparrow (*Peucaea aestivalis bachmani*).—The following account of the interesting vocal performances of this sparrow is based on notes made April 1, 1917. My records were confirmed on other occasions during several following weeks. The voice of one individual, especially, was studied. I was in the company of Mr. A. F. Ganier of Nashville, Tenn., who later collected the specimen. The bird was in its characteristic habitat, the border of a patch of open upland woods near Nashville; and it was perched on a fence post. We stood for fully five minutes not more than twenty-five feet away.

The bird sang with only short rests, and the duration of the song which was very variable, was about two to three seconds. Usually, the song started with a single long note followed by a group of short notes in a tempo so fast that we could not be sure of our count. So far as we could determine, the bird had seven to twelve notes in this group, usually about ten. As a rule, they were of essentially uniform pitch, but not of the same pitch as the long opening note. The pitch was sometimes lower than that of the first note and sometimes higher. A few performances had two or three opening notes not so long as the usual, single one. On one occasion, the song was repeated or rather one song followed another with no interruption or pause, both being a little shorter than usual.

The quality was remarkably variable, but it tended to be fairly uniform in a single song. Sometimes the series of rapid notes was thin and resembled somewhat the song of a Junco. At other times, it was relatively rich and full. Intermediate grades of quality occurred.—R. M. STRONG, Nashville, Tenn.

Summer Tanager (*Piranga rubra rubra*) in N. E. Illinois.—The Summer Tanager is of so rare occurrence in northern Illinois, that I had never taken one in forty-five years collecting, until May 19, 1917, when my friend Lyman Barr brought me a very beautifully marked specimen, which he had shot in a clump of woods two miles west of Highland Park.

It proved to be an adult female. The upper parts are of the usual brownish olive, but are variegated with a reddish wash on the occiput and middle of the back.

The sides of the neck, upper and lower tail coverts, and a band across the breast are pale poppy red, giving the bird a very striking appearance.—HENRY K. COALE, Highland Park, Ill.

Bohemian Waxwing (*Bombycilla garrula*) **Breeding within the United States**.—While carrying forward field work for the Biological Survey, U. S. Department of Agriculture, in the State of Washington, during the past summer, it was reported to me by E. F. Gaines, in charge of crop investigations, Washington Agricultural Experiment Station, Pullman, Washington, that he had found the Bohemian Waxwing breeding in the vicinity of his old home place at Chewelah, Stevens County, Washington. The nest was found about June 11, 1907, on Chewelah Creek, six miles in a general northerly direction from the town of Chewelah.

In point of time the present appears to be the second actual record for the breeding of *Bombycilla garrula* within the United States. Dr. T. S. Palmer calls my attention to the fact that the first published notice of the species as a breeding bird within our borders is that of a Dr. C. S. Moody, who recorded the discovery of a nest and five eggs in the vicinity of Humbird (mail Sandpoint), Bonner County, Idaho (Pacific Sportsman, Vol. 2, June, 1905, p. 270). Mr. F. M. Dille, Reservation Inspector, Biological Survey, reported the Bohemian Waxwing nesting at Lake Clealum, Kittitas County, Washington, on July 15, 1911.

I am indebted to Miss May T. Cooke for calling my attention to the fact that Aretas A. Saunders published a note (Condor, Vol. 14, November, 1912, p. 224), concerning observations of the Bohemian Waxwing made at 5200 feet altitude, Canadian Life Zone, on the West Fork of Sun River, northern Lewis and Clark County, Montana, on August 18 and 21, 1912. Saunders says the birds seen had probably nested in the vicinity.

The records are all for Canadian Zone, or for Transition Zone not far from the Canadian Zone boundary. They indicate that the Bohemian Waxwing occurs, probably rarely, as a breeding bird within our borders in the coniferous forests of the northern Rocky Mountain region, in a district embracing northwestern Montana, northern Idaho, and northern Washington.

To summarize, records at hand for the breeding of *Bombycilla garrula* within the United States are four in number, as follows: 1905 (nest probably found in 1904), Humbird (mail Sandpoint), Bonner County, Idaho, Dr. C. S. Moody; 1907, June 11, Chewelah Creek, six miles in a general northerly direction from Chewelah, Stevens County, Washington, E. F. Gaines; 1911, July 15, Lake Clealum, Kittitas County, Washington, F. M. Dille; 1912, August 18 and 21, West Fork of Sun River, northern Lewis and Clark County, Montana, Aretas A. Saunders.—WALTER P. TAYLOR, Washington, D. C.

Philadelphia Vireo (*Vireosylva philadelphia*) in North Dakota in Summer.—The writer found a Philadelphia Vireo (*Vireosylva philadelphia*) on July 8, 1917, at the south end of Carpenter Lake in the Turtle Mountains, North Dakota. The bird was in full song and evidently at home among the trees of a grove of aspens (*Populus tremuloides*) close to the shore of the lake. This represents the westernmost breeding record of the species for the United States, and is the first published summer occurrence for North Dakota.—HARRY C. OBERHOLSER, Washington, D. C.

Prothonotary Warbler (*Protonotaria citrea*) in New Jersey.—The rarity of the Prothonotary Warbler (*Protonotaria citrea*) in the state of New Jersey is sufficient reason for placing on record a specimen which has for years been in the Biological Survey collection in the United States National Museum. This is an adult male in perfect plumage, No. 137667 of the United States National Museum collection, and was taken at Morris-

town, New Jersey, June 14, 1888, by Mr. L. P. Scherrer. So far as we are aware, this is the fourth record of this species in New Jersey and the second specimen secured.—HARRY C. OBERHOLSER, *Washington, D. C.*

The Subspecific Name of the Northern Parula Warbler.—To change the well-established name of any bird for almost any reason has always seemed to me something best left undone. Nevertheless there are cases where it cannot be avoided. This, perhaps, is true of the one thus referred to by Dr. Oberholser, in a personal letter dated January 21, 1918. "You will note that in your paper in 'The Auk,' XIII, 1896, p. 44, you rejected the name *Sylvia pusilla* Wilson (Amer. Orn., IV, 1811, p. 17, pl. 28, fig. 3), because presumably preoccupied by *Sylvia pusilla* Latham (Supplement Ind. Orn., 1801, p. 56). This latter name, however, results merely from the putting into the genus *Sylvia* of *Motacilla pusilla* White (Journ. Voy. New S. Wales, 1790, p. 257, pl. 42), which is now *Acanthiza pusilla* (White). According to our present rules of nomenclature, the name *Sylvia pusilla* Latham, not being an original description, but merely a nomenclatural combination, does not prevent any subsequent use of the same combination; therefore, the name *Sylvia pusilla* Wilson, of which the type locality is eastern Pennsylvania, becomes available for the northern form of the warbler which you named *Compsothlypis americana usneæ*, and which would, therefore, stand as *Compsothlypis americana pusilla*. I think I have thus given you all the references and data necessary to write up the matter for publication, and I trust I have made myself clear. It seems very much better for you to make the change than for me to do so, since you were the discoverer and original describer of the subspecies."

With the above statement of fact and opinion I now see no reason to disagree—especially as the change thereby suggested will result in the restoration of a time-honored name, to which Wilson seems justly entitled. Nor could any one be otherwise than pleased with courtesy so gracious and self-obliterative as that expressed in the closing sentence of Dr. Oberholser's characteristic letter.—WILLIAM BREWSTER, *Cambridge, Mass.*

Bachman's Warbler and Solitary Sandpiper in Indiana.—On May 16, 1917, while working through a fine bit of warbler woods near Indianapolis, I was startled by an apparition of a male Bachman's warbler (*Vermivora bachmani*). The pretty fellow popped up from a low bush in a mass of undergrowth and after fluttering among the twigs for a moment dropped down out of sight. I was about to conclude that I had been dreaming of rare warblers when up came the bird again from the same bush and his second visit was much longer than his first. I had a fine chance to note his yellow forehead and throat with the great splotch of black on his chest. After a time he left for a distant part of the woods traveling leisurely from low bush to low bush inspecting the twigs critically and taking insects constantly. I finally lost him. Afterward I visited the woods several days in succession hoping to see the bird but without result

until about a week later when I had the good fortune to see both male and female.

I frequently saw one or the other of the birds, occasionally both together, all during the breeding season but was not able to locate a nest though feeling sure that they had built one in that immediate vicinity.

The character of the woods was such as would appeal to a Bachman's Warbler in breeding time. High trees with thick undergrowth covered rolling ground, each depression being very damp and almost swampy. In the densest part of the woods there was a stagnant pool and in and about this pool a pair of Solitary Sandpipers elected to spend the time from April to the middle of June after which time I was unable to watch them, being out of the city. Early in the season they paid very little attention to visitors and when disturbed would fly up with their characteristic piping notes, then immediately settle down again in the very place where they had been feeding, but about the first of June only one bird was in evidence at a time and when a visitor approached it would scurry out of sight into the mass of swamp willows which filled the center of the pool. Might not these birds have been nesting there, too?—ETTA S. WILSON, *Detroit, Michigan*.

The Canada Warbler again in Colorado.—A specimen of the Canada Warbler (*Wilsonia canadensis*) was taken on Clear Creek, Colo., near Denver, by my brother, Arthur Rett, on May 26, 1917. It is a male in excellent plumage, and is now in my collection.—E. RETT, *Denver, Colo.*

Mockingbirds (*Mimus polyglottos polyglottos*) Spending the Winter at West Haven, Conn.—I announced in the April, 1917, number of 'The Auk' the presence of a Mockingbird in West Haven, Conn., from November 8, 1916, to March 24, 1917.

On July 17, 1917, the bird returned and is passing the winter at the same place. (January 20, 1918.) Last winter the bird would not take food put out for it but preferred to eat Honeysuckle and Bittersweet berries, but this winter it takes food put out for it and has become so tame as to alight on the windowsill and eat food. I have also observed it eating the dry seed pods of the asparagus which it swallowed whole as it does the berries of the Bittersweet.

On November 18, 1917, while at Colonial Park, a summer resort about two miles from West Haven, I observed another Mocker which was eating the berries of a Honeysuckle vine that grew along a fence. The extreme cold weather during the last few days of December and the first of January, I thought would surely kill our Mocker, but he came through all safe and seems none the worse. During that time the thermometer went as low as twelve degrees below zero, which proves that Mockingbirds are not altogether southern birds but can stand our northern winters. The plumage of this bird is quite different this winter, having a great deal more white in the wings and tail so I would judge that it was a young bird when it passed the winter of 1916 and 1917 with us.—NELSON E. WILMOT, *West Haven, Conn.*

The Hudsonian Chickadee (*Penthestes hudsonicus* subsp.?) in North-eastern Pennsylvania in June.—In company with Richard C. Harlow, Richard F. Miller and Albert D. McGrew, I spent three weeks in the field in the spring of 1917 about La Anna, Pike County, Pa., and June 3, while searching a large sphagnum bog for a nest of the elusive Northern Water-Thrush, two brown capped chickadees were seen. I had gotten a little behind the others and was hurrying to catch up to them when the unmistakable nasal "chick-a-dee-dee" of one of these birds was heard. It had happened that earlier in the spring I had seen a single individual (Auk, 1917, p. 344) and had become familiar with its notes so I recognized it at once. The birds, two of them, were feeding in several small tamaracks and with characteristic lack of timidity allowed a close approach where their identity was established beyond doubt. They showed a preference for a certain part of the bog that we had been floundering through but although several suspicious looking holes were found, we could detect no signs of their nesting. I returned to this spot the next day, and had no difficulty in finding the birds again. This time I spent two hours trailing them but with no success other than leaving with the conviction that they were mated and if not as yet nesting here, would undoubtedly do so. Not satisfied, however, all of us returned the following day and made another attempt but with no more luck though we again found them at the same place. The necessity of leaving soon after for another part of the state made further study of the birds impossible. From what we had seen, however, there seemed little doubt but that the birds intended to breed in this tamarack swamp. The situation in which they were found was typical of that much farther north, being indeed a northern muskeg in every sense of the word, with lichen covered tamarack, deep beds of sphagnum moss and scattered pools.—THOS. D. BURLEIGH, *State College, Pa.*

Hudsonian Chickadee on the Pocono Mountain, Pa.—On the morning of June 17, 1917, at Pocono Lake, Pa., I found a pair of brown-headed chickadees, probably the Labrador (*Penthestes h. nigricans*). The location was at the edge of a sphagnum swamp amid a dense grove of dwarf spruces. When discovered the birds evidenced considerable excitement and came and scolded within three feet of me. Their actions and movements were more deliberate and confiding than those of either the Black-capped or Carolina species. I noticed one of them examining a small hole in a decayed stub which led me to believe it to be a nesting site. This was not the case however, although the conditions seemed favorable, as the cavity contained nothing but a few chips of bark. The birds remained in the locality during all the time that I was there.

On the following morning I found the birds again in the same location but was unable to study them subsequent to this as I made my departure from the district that afternoon.

Mentioning my discovery to Mr. John D. Carter, who had arranged to visit the country a week later, he made a further search for the birds but was able to find but one of them.

The outcome of these observations did not reveal that the birds had nested or were intending to nest in the locality, but the occurrence so far south is interesting.— J. FLETCHER STREET, *Beverly*, N. J.

Hudsonian Chickadee (*Penthestes hudsonicus subsp.?*) at **Princeton, N. J.**— There were four of these birds upon my place from November 18 until March 31 of last year, 1916–1917, during which period I saw one or more of them almost daily feeding upon the suet near my window.

I thought, at the time, that they were the Acadian variety, with which I am familiar in northern Maine, although I noticed that they seemed darker than any specimens which I had previously observed.

I was unaware at the time of Dr. Townsend's Labrador subspecies, to which they may have belonged.

I have neither seen, nor heard of, any in the neighborhood this year.— HENRY LANE ENO, *Princeton*, N. J.

A Robin which Migrated Tailless.— In the spring of 1914 a tailless male Robin arrived in the Boston Public Garden, a plump, brightly plumaged bird, and remained there as one of a breeding pair. During the weeks succeeding his arrival there was no perceptible development of a tail. On April 13, 1915, there again arrived a tailless male Robin on a morning when several females joined the company of males already present. This tailless male adopted the same limited area of the Garden as did the tailless bird of the preceding year. So the almost unavoidable conclusion was that it was the same bird, and that it was not a mere coincidence. On April 19, 1916, again a tailless male Robin arrived and again adopted the same small area of the Garden as his possession, a plump and brightly plumaged bird as before. The conclusion was then confirmed beyond reasonable doubt that it was indeed the same Robin back for the third season without a tail. This being so, the fact was that this Robin had made his migratory flights for three successive years without the aid of any tail as a rudder in flight. Neither season did any tail develop. Apparently the bird had lost the fleshy tip from which tail feathers could be developed. There was no change in its appearance, season by season. In the season of 1914 the first Robins came to the Garden on March 25 and during the next few days were joined by others. In 1915 the first Robin arrived on March 19 followed by others within a week. In 1916 the first two Robins came to the Garden on March 25, and on April 1 a dozen resident males were present. Thus it is perceived that the tailless Robin was a rather later arriving bird each season. Twenty resident Robins were already present in the Garden when he came north in 1915 and 1916. So, perhaps, this tailless Robin made his migratory flights less speedily than did others. But this supposition would seem to be not very strongly based for the reason that Robins are arriving usually throughout the month of April, and the tailless bird was not really behind time. The only conclusion to be drawn, therefore, would seem to be that the bird had experienced little or no disadvantage in flight due to not possessing a

tail, or if its absence had been a disadvantage, he had effectively overcome it. We looked for this tailless Robin in the spring of 1917, but in vain; he did not come to the garden.—HORACE W. WRIGHT, *Boston, Mass.*

Connecticut Notes.—The following recent records are, perhaps, worth recording. They are all Stamford records, except where otherwise noted.

Melanerpes erythrocephalus. RED-HEADED WOODPECKER.—An adult male was taken May 27, 1916.

Empidonax virescens. ACADIAN FLYCATCHER.—Male taken May 24, 1915. Another male taken May 27, 1915. A female taken May 29, 1916.

Acanthis linaria linaria. REDPOLL.—Several flocks of from twenty-five to fifty birds were observed each week from December 25, 1916 to February 12, 1917. They were usually feeding in high, weedy fields on the edge of woods, but were sometimes grouped in the maple trees at the edge of the field, and on several instances on the lawn around the house. They have never been so common in this vicinity before to my knowledge. I think I have not seen more than half a dozen Redpolls before this in Stamford in the last twenty years.

Passerculus princeps. IPSWICH SPARROW.—An adult male was taken January 20, 1917, in the low sedge bushes at the edge of salt meadow at East Norwalk.

Passerculus sandwichensis savanna. SAVANNAH SPARROW.—A male was taken January 20, 1917 in the sedge bushes at the edge of the salt meadow at East Norwalk. The bird was in company with the Ipswich Sparrow noted above, and was apparently a healthy bird and a winter resident.

Zonotrichia albicollis. WHITE-THROATED SPARROW.—Two flocks of twenty-five birds or more in each were seen in some weedy fields at Darien on November 30, 1917. The latest record given in Bishop and Sage's 'Birds of Connecticut' for fall migration was November 28, 1885. A male was taken to verify the field identification, and in view of the rather unusually cold fall, this very late record seems interesting.

Vermivora peregrina. TENNESSEE WARBLER.—An adult male was found dead in the wire of my tennis court on May 20, 1916. An adult female was found dead in the same place June 2, 1917. Both of these birds were found within a few hundred yards of the place at which I took three specimens on May 20, 1892, which are already recorded.

Dendroica palmarum palmarum. PALM WARBLER.—A female was taken October 12, 1917 in my garden. It was feeding around the vegetable plants in company with several Yellow Palm Warblers.

Oporornis philadelphia. MOURNING WARBLER.—An adult male was taken May 30, 1917 at Mud Pond, a few miles north of New Canaan. The bird was feeding in low bushes and on the ground at the edge of a growth of high woods on rather a wild hillside above the lake.—LOUIS H. PORTER, *Stamford, Conn.*

Massachusetts Notes.—The following records taken from my note book which refer either to birds rare in Massachusetts or to unusual dates of occurrence. The specimens were taken by myself, with the exception of the Black Vulture (*Catharista urubu*) and Labrador Horned Owl (*Bubo virginianus heterocnemis*), and all specimens are preserved in my collection.

Stercorarius longicaudus. LONG-TAILED JAEGER. On July 23, 1910, about five miles east of Pigeon Cove, part of Rockport, Mass., female specimen taken.

Larus hyperboreus. GLAUCOUS GULL. On April 20, 1915, near the Salvages off Rockport, Mass., immature female specimen taken.

On April 24, 1915, in the same locality, an immature male specimen taken.

Larus leucopterus. ICELAND GULL. On April 19, 1915, I saw a beautiful entirely snow white Iceland Gull sitting beside a Herring Gull, on the breakwater off Rockport, Mass. At the distance seen, about fifty yards, the bill was conspicuously all black, the back looked the same as the breast snow white and when the bird flew I saw that the ends of the wings were white.

On Jan. 22, 1916, near the Salvages off Rockport, Mass., I saw six Iceland Gulls. The birds were flying about, among a large number of Herring Gulls, and were seen near enough to positively identify them, allowance being made for seeing the same bird twice, in giving the probable number of six. Two of the birds were taken, both males, one of which was an adult, with mantle pale pearl-blue and fresh color of bill a very delicate shade of light green, with yellow spot, almost an orange shade, on the lower mandible near angle, and a lighter yellow spot, somewhat diffused and not as pronounced, on the upper mandible just over the spot on the lower mandible. The measurements and weights of the two birds were practically the same.

On May 13, 1916, near the Salvages off Rockport, Mass., I saw an Iceland Gull, near enough, several times, to positively identify the bird.

On Feb. 22, 1917, in the same locality, I saw an Iceland Gull, which came within thirty-five yards of the boat.

On Feb. 4, 1918, a short distance off Rockport, Mass., I saw three Iceland Gulls, two of which were taken, both immature males.

On Feb. 11, 1918, same locality, two immature female specimens taken.

Larus kumlieni. KUMLIEN'S GULL. On Jan. 31, 1913, a short distance off the shore of Lanesville, part of Gloucester, Mass., an adult female specimen was taken.

Puffinus griseus. SOOTY SHEARWATER. On May 29, 1916, about six miles east of Pigeon Cove, Mass., a female specimen was taken.

Arquatella maritima maritima. PURPLE SANDPIPER. On May 30, 1917, on the Salvages off Rockport, Mass., I saw a flock of about forty Purple Sandpipers, six of which were taken.

Catharista urubu. BLACK VULTURE. On May 12, 1916, at Pigeon Cove, Mass., a specimen was taken, sex undetermined.

Bubo virginianus heterocnemis. LABRADOR HORNED OWL. About

Dec. 22, 1917, at Marshfield, Mass., a male Labrador Horned Owl was taken by Mr. Wilbur Ewell. Mr. C. E. Shaw was at Marshfield on Dec. 26, 1917, and saw the recently taken specimen and was told by Mr. Wilbur Ewell that he shot the bird the latter part of the week before (he thought the 22nd), on Hen Island, near the edge of the salt marsh. I am indebted to Mr. Shaw for giving me the specimen in the flesh with the data. On dissection, the bird was not fat and there was nothing in the stomach. The specimen was identified by Mr. William Brewster, Mr. Charles F. Batchelder and Mr. Outram Bangs, being compared with specimens in Mr. Brewster's collection and later Mr. Bangs kindly compared the specimen with those in the Museum of Comparative Zoology.—CHARLES R. LAMB, Cambridge, Mass.

Massachusetts Notes.—On May 7, 1917, Messrs. C. W. Welch and Henry M. Murphy caught alive in Stoughton, Mass., an adult Greater Snow Goose (*Chen hyperboreus nivalis*). The primaries of one wing were gone, not cut. This specimen is now on exhibition at the Boston Society of Natural History, through the generosity of its captors.

On February 10, 1918, a Kingfisher (*Ceryle alcyon alcyon*) was seen flying over a frozen salt marsh at Cohasset, Mass. No open water was to be seen anywhere save the open ocean between Duxbury and Boston.—W. SPRAGUE BROOKS, *Boston Soc. Nat. Hist., Boston, Mass.*

Notes from the Chicago Area.—I would like to report the following rare birds for this locality.

Two fine specimens of the Long-tailed Jaeger (*Stercorarius longicaudus*) have been taken near Chicago; the first by Mr. Frances T. A. Junkin who writes me as follows: "the bird was seen in Lake Como, Walworth County, Wisconsin, in October, 1916. It was flying high over the middle of the Lake and seemed to be looking for something. It was so markedly a strange bird that it was taken for my collection." The bird is in the dark, immature plumage, without the long tail feathers.

The second bird is also in the dark plumage, a rich gray with fine penciling of a lighter color. This bird was seen first on August 20, 1917. While watching the gulls and terns, at Miller's, Indiana, we were rather startled by a ghost-like gray bird, which glided by us, more like a hawk than a gull. I reported the bird to the fishermen at Miller's, and asked them to let me know if such a bird should be seen around their nets. On September 11, 1917, the bird was found dead on the beach, and is now in the collection of the Chicago Academy of Science.—FRANK M. WOODRUFF, *Chicago Acad. Sci., Chicago, Ill.*

Notes on some British Columbia Birds.—**Colymbus nigricollis californicus.** EARED GREBE.—This species was first taken in the Okanagan District by Mr. Allan Brooks, on May 23, 1912. An adult male was collected by the writer on September 30, 1915. Sight records were

made on the following dates: May 31, 1912, one; May 27, 1915, one; May 10, 1917, two; October 2, 1917, two.

Gavia stellata. RED-THROATED LOON.—On November 22, 1915, the writer picked up a juvenal female, on the shore of Okanagan Lake. This is the first record for the Okanagan District.

Querquedula discors. BLUE-WINGED TEAL.—Common in the Cariboo District. A number of specimens were sent to me in the flesh, from 105 Mile House, in the fall of 1915. They are comparatively rare in the Okanagan District. Five were seen during the month of May, 1915, and three of them secured.

Recurvirostra americana. AVOCET.—There is a mounted specimen, unsexed, in the Provincial Game Wardens office at Vancouver; shot near the mouth of the Fraser by Mr. N. H. Bain on September 20, 1915. This is the second record for the province.

Macrorhamphus griseus. LONG-BILLED DOWITCHER.—An adult male, in breeding dress taken on July 30, 1915, and two juvenal males collected on September 9, 1916, are the only Okanagan records.

Strix occidentalis caurina. NORTHERN SPOTTED OWL.—Mr. T. L. Thacker of Hope, B. C., recently sent me the wings and head of a Northern Spotted Owl that had been shot near Klesilkwa Creek in the Hope Mountains, on June 24, 1916. Mr. Thacker informs me that he has seen these "brown eyed owls" several times, in heavily timbered country, on the pacific side of the Hope Mountains.

Chætura vauxi. VAUX'S SWIFT.—Common near Hedley in the Semelkameen Valley. A number were seen in the narrow, deep, Nickle Plate Canyon, dashing about the cliffs in company with Violet-green Swallows. Several females that were collected on June 7, 1917, showed worn breeding patch. It is possible that they nested in some of the deep crevices in the high cliffs.

Mr. T. L. Thacker sent me a nestling in the flesh, from Yale, B. C. It had fallen from a nest that was built under the roof of the C. P. R. water tank. There are a number of small openings under the eaves, and Mr. Thacker tells me that several pairs breed there every year.

Aëronautes melanoleucus. WHITE-THROATED SWIFT.—Major Allan Brooks published a sight record in 1909.¹ The following year he made a trip to the southern Okanagan, in search of this bird, but was unsuccessful. No further reports of its occurrence were received until the summer of 1917, when Mr. George N. Gartrell, found a breeding colony, estimated at seven pairs, in a rock bluff near Vaseaux Lake. He was able to secure two specimens on June 29; these skins are now in my collection.

Zamelodia melanocephala. BLACK-HEADED GROSBEEK.—An adult male, taken at Okanagan Landing, on May 30, 1916, is the only local record.—J. A. MUNRO, *Okanagan Landing, British Columbia.*

¹ Auk, Vol. XXVI, No. 1, January, 1909.

Notes on some Species New to the Colorado List of Birds.—Among the results accomplished through a biological survey of Colorado by the Colorado Museum of Natural History, the following notes are of general interest and it seems advisable to record them at this time.

Tympanuchus pallidicinctus. LESSER PRAIRIE CHICKEN.—As the presence of this bird within the limits of Colorado was considered probable, a special trip was made into the extreme southeast corner of the state (Baca County) during May, 1914. The first specimen was secured May 24 (C. M. N. H. No. 4146, adult male). Another trip into the same territory from Sept. 21 to 23, of the same year afforded additional specimens of both sexes.

It was assumed that this region marked the northernmost limits of their range but in the fall of 1916, they were found to be fairly common in the sandhill country immediately to the south of the Arkansas River in the vicinity of Holly, Prowers County, where specimens were obtained. Systematic search, however, failed to disclose any evidence of their presence on the north side of the river, where the country is, in fact, quite different and unsuited to their needs. The Arkansas River, therefore, may be considered as the northern boundary of the range of this species.

Dryobates p. medianus. DOWNY WOODPECKER.—This variety is given in the Check-List as extending to "eastern Nebraska and Kansas" and it would seem that it is still further extending its range to the westward as a pair of typical specimens were collected on Dry Willow Creek, Yuma County, on Aug. 19, 1915, (C. M. N. H. Nos. 4760 and 4787) forming the first and second records for Colorado.

Loxia leucoptera. WHITE-WINGED CROSSBILL. These birds have been reported on previous occasions from Colorado but investigation has failed to show wherein any of these occurrences have been based on specimens actually collected and preserved. An adult male (C. M. N. H. No. 6585) collected at Silver Lake, Boulder County, on May 17, 1917, is therefore, apparently the first record specimen.

Spizella p. arenacea. WESTERN FIELD SPARROW. The first record specimen of this subspecies for Colorado is an example (C. M. N. H. No. 6142) taken in the vicinity of Holly, Prowers County, Sept. 21, 1916. It is an immature female and when secured was associated with a mixed flock of *S. pallida* and *S. breweri*.

Passerella i. iliaca. FOX SPARROW. The occurrence of this bird in the Clear Creek Valley within a few miles of the foothills near Golden, Jefferson County, was most unexpected. The specimen, an adult male (C. M. N. H. No. 6016) was secured Nov. 1, 1916.

Helinaia swainsoni. SWAINSON'S WARBLER. The presence of Swainson's Warbler in Colorado is decidedly unique and extends the possible range of the species several hundred miles to the westward. The specimen forming the record, is an adult female (C. M. N. H. No. 2806) and was secured near Holly, Prowers County, on May 12, 1913, from a dense growth of willows, frequented at that time, by numbers of Bell's Vireos.

Vermivora luciae. LUCY'S WARBLER. The fact that the first record for this bird in Colorado was also found breeding, makes it seem possible that the species has been overlooked by other collectors. Two specimens (C. M. N. H. Nos. 3384 and 3385) together with their nest and eggs, were collected at 'Four-corners' in Montezuma County on May 3, 1913.

Hylocichla mustelina. WOOD THRUSH. The first record specimen of the Wood Thrush was taken near Holly, Prowers County, on May 12, 1913 (C. M. N. H. No. 2629). It seems not unlikely, however, that the bird is extending its range westward. Confirmatory evidence for this belief is afforded by two additional specimens collected on Dry Willow Creek, Yuma County, on June 24, 1915.—F. C. LINCOLN, *Denver, Colo.*

Subsequent Nestings.—I was much interested in reading of Mr. J. K. Jensen's experience (Auk, January, 1918, pp. 83-84) with the White-rumped Shrike (*Lanius ludovicianus excubitorides*) at Wahpeton, North Dakota, in 1917, as they are very similar to mine at Hatley, Quebec, in the same year with the Migrant Shrike (*Lanius ludovicianus migrans*) an account of which it had been proposed to add as a postscript to my "A Study of Subsequent Nestings after the Loss of the First," Auk, Vol. XXXIV, 1917, pp. 381-393, but which had to be omitted at the last moment owing to unforeseen circumstances. My pair of birds laid four sets of eggs in succession, the first set being taken on May 30, and the last on July 4, thus again giving practically eleven days interval between each set. The first two consisted of six eggs each, the third of five, and the fourth of four, the first nest being in an apple tree twelve feet up, the second in a fir eighteen feet up, and seventy-one yards from the first, the third in the same apple tree as the first only seventeen feet up, whilst the fourth and last was again in an apple tree twelve feet up, and eighty-three yards from the fir tree, the site of the second, and one hundred and fifty-four yards from the apple tree, the site of the first nest. Now the most interesting fact to me was the pigment in these eggs, for whereas with each successive set the size, beauty and construction of the nests fell off, as well as the number of the eggs, the pigment or coloring increased if anything, the last set being equally or more highly pigmented than any of the others. At a Meeting of the Nuttall Ornithological Club held at Cambridge on November 19, 1917, at which I was present, I mentioned the above case. It was suggested by one of the members present (I believe it was Mr. Bangs) that the apparent higher coloring of this last set might be due to an increased thinness of the inner membrane or lining of the shell, or to the thinness of the shell itself, or both. The latter (thickness of shell) I have examined with a microscope through the blow hole as well as I was able, but can detect no apparent difference, but this is no easy matter to decide off hand, and will require much more careful consideration. It seems to me that we have here an interesting field for further investigation, as there really does not appear to be much known or at all events published on the causes and effects governing the pigment of eggs. The English

Sparrow (*Passer domesticus hostilis*¹) amongst its many other sins, has been responsible to a large extent for the generally prevailing idea that as sets increase pigment decreases (which seems to be the rule in its case for some unexplained reason), but my 'A Study of Subsequent Nestings' already referred to, goes a long way I think to demonstrate that the opposite is the more general rule in the case of other birds. What we really want is a special work dealing with the subject, such as Dr. Bergtold's 'The Incubation Periods of Birds' and Dr. Casey Wood's 'The Fundus Oculi of Birds,' wherein the subjects are fully dealt with and discussed in all their bearings.—H. MOUSLEY, *Halley, Que.*

The Destruction of Nests by Farming Operations in Saskatchewan.—During the summer of 1917 from May 1 to June 15 I worked on a 1200 acre grain farm located near a small town, Estlin, sixteen miles south of Regina, the capital of Saskatchewan. This time included the earlier nesting wave which might be said to extend through the last weeks in May and the first in June. It is then that the greatest damage is done to nesting birds through agricultural operations.

The region in which the farm was situated was one vast treeless plain. Natives at one time or another have tried to grow trees and shrubs about their dooryards but these have either died or merely grown to a height of ten or twelve feet. Of course all parts of Saskatchewan are not treeless for in Regina there are fair sized shade trees along the streets and still farther north there are forests. The land is owned in large tracts of a half section or more, the largest of which I heard covering 16 sections. It is under an extensive system of farming with oats, wheat and flax as the staple crops. Most of the land is under cultivation but there is still some in lots of a half to two sections left in virgin prairie. One would naturally expect that the wild ducks and other ground nesting birds would select the prairie for nesting sites, but such was not in accordance with my observations, as I found that the great majority chose the cultivated areas.

The ducks and the Chestnut-collared Longspurs were found to be most abundant; of the former, Pintails were in the lead, with Mallards, Teals, and Baldpates in lesser numbers. Canada Geese did not nest there at all, but I was told that they breed commonly not far to the north. Marsh Hawks and Short-eared Owls were very common, as were Red-winged Blackbirds, Killdeer, and Western Meadowlarks.

The growing season is so short that the ground must be prepared with the greatest speed in the spring, since the large crops and early winters allow little time for fall plowing, thus leaving nearly all to be done just before seeding. We were plowing, disking, harrowing, and drilling grain until the first week in June, while the first duck nest was found on May 6, making at least a full month during which the farming operations may cause the destruction of nests. As above stated the ducks seem to prefer the stubble fields to the prairie, for of the twenty-five nests which I examined all but five were in the former kind of situation; of the remaining five,

¹ See Oberholser, Auk, 1917, p. 329.

four were in grass between stubble fields and roads, and only one was on the prairie.

It is a common practice in Saskatchewan to burn off the stubble. This is usually accomplished in the following way: A section of a harrow is dragged about six feet behind a hay or grain rack loaded with straw; a day with a strong wind is selected as soon as the stubble is dry enough to burn freely; one man drives the team slowly along the windward side of the field while another pitches straw onto the fire which is built on the harrow and thus keeps it burning. The stubble catches fire readily and whole sections may be burned over in this manner in a few hours. The usual time for burning over the land is after the first week in May, since before then the stubble is not dry enough. Many nests are destroyed in this way. I found the remains of three duck nests and one Marsh Hawk nest in one burned field. On June 9 I flushed a Mallard from a burned field and on investigation found a much charred nest containing seven smoky eggs all of which were rotten, and yet that poor bird had been incubating those eggs for two weeks since the fire had spoiled them. The straw stacks are also burned at this time. A neighbor was engaged in this work one day, May 24, when he noticed a 'Prairie Eagle' [Ferruginous Rough-legged Hawk] rise and circle around the straw stack he was about to ignite. He climbed to the top of the stack and there found the nest containing five beautifully marked eggs, which he collected and gave to me before burning the straw. As these stacks are very common, in fact they are about the only thing that breaks the horizon, it is probable that many nests are burned with them each spring.

When the stubble is not burned, the fields are usually disked, although sometimes the wheat or oats is drilled right into the stubble without any earlier preparation of the soil. In this way the nests are disturbed by the blades of the disks and drills. Some farmers give their men strict orders to lift the drills or to drive around the nests whenever possible. If the birds happen to be on their nests it is an easy matter to locate them for they usually flush just in front of the horses. I remember twice that the horses had walked over brooding ducks which did not fly up until the disks were about to roll over them. In a case of this sort and also when the birds are not setting, it is practically impossible to see the nests in time to save them. I recollect three nests which were seen barely in time to save them. The first was a Sharp-tailed Grouse which flushed from her nest and fourteen eggs just beside the horses. By the time the horses were stopped the wheel of the drill was within a few inches of the nest and another step would have ruined it. The other two were those of a Desert Horned Lark and of a Killdeer which were similarly discovered when one more furrow by the plow would have turned them under. Occasionally ducks build their nests in sunken spots so that disk-harrows and drills may run over them without damaging the eggs. One nest was run over successively by a disk, a scrub or drag, a drill, and a team of six horses, but miraculously escaped without having even an egg cracked. This bird continued to incubate despite all the interruptions.

Marsh Hawks and Short-eared Owls are fellow sufferers with the ducks. These two birds are very necessary to that country for mice are unusually common and the hawks and owls are about the only means of keeping them in check. All four hawk nests which I found were built in stubble fields and were broken up by farming operations. Five owl nests were located; three of these were spoiled, but the other two were collected before something else could happen to them. Of the 35 duck, hawk, and owl nests which I examined I know of only five in which the eggs hatched. The one redeeming feature lies in the fact that probably the greater part of the second sets hatch and the young mature in good shape, for there are few farming operations at the time when they would be found and there are few natural enemies to interfere with them.—WALTER A. GOELITZ, *Ravinia, Illinois*.

Goudot's Explorations in Colombia.—In his recent work on 'The Distribution of Bird-Life in Colombia,' Dr. Chapman refers (p. 11) to a "French collector, resident in Bogotá," who began to send bird skins to Paris about 1838 or 1839. This collector was probably Goudot and that some of his specimens must have reached Europe at least ten years earlier will be evident upon turning to the account of *Chamaepetes goudoti* on p. 197. This species described by Lesson, in 1828, was named in honor of Justin Goudot, a French naturalist and botanical collector, a native of Jura, who secured the type in the Quindio region, in 1827, and who spent many years in Colombia collecting zoölogical and botanical specimens. As information regarding his work is not generally accessible, the following summary may be of interest.

According to La Sègue,¹ from whose brief account the following facts have been mainly derived, Goudot was an attache of the Paris Museum. Nearly a century ago, in 1822, in company with several other Frenchmen he was called to Bogotá by the government of Colombia (then known as New Grenada), to assist in founding various scientific establishments. For five years he remained in the service of the government collecting in different parts of the country. In 1823 he began work on the coast of Venezuela in the vicinity of Porto Cabello, then went to Santa Marta and ascended the Magdalena River to Bogotá. In the following year he worked eastward across the cordillera to the plains of Meta and then southward crossing the Ariari and the Guayabero, two branches of the upper Orinoco. He then returned to Bogotá and in 1825 directed his course northward along the cordillera to the valley and emerald mine of Muzo. In 1826 he collected in the mountains southwest of Bogotá, in the vicinity of the natural bridge of Icononzo or Pandi. In 1827 he resigned from the service of the government but continued his work of collecting natural history specimens. He crossed the valley of the Magdalena to the west in order to explore the rich vegetation of the Quindiu region and it was on this trip undoubtedly that he secured the type of

¹ La Sègue, A., *Musée Botanique de M. Benjamin Delessert*, pp. 471-472, Paris, 1845.

Chamæpetes goudoti. Two years later, in 1829, he visited the Pyramid of Tolima, one of the highest peaks of the northern Andes. In 1830 he crossed the central cordillera and visited the northern part of the Cauca Valley. On his return two years later he recrossed the cordillera farther north in the mountains of Hervé. In 1835 he explored the valley of the upper Magdalena south of Honda. During the next few years he was obliged to devote his attention to other work but employed his spare time in studying the natural resources of the regions where he lived. In May 1842, he started on his return to Europe. After descending the Magdalena he went to Santa Marta, visited the mountains in the interior, and while delayed at Carthagena, examined the flora between that point and Turbaco. Finally he reached Havre, France, in December, 1842.

During the four years from 1843 to 1846 Goudot published a dozen papers on the botany and zoölogy of Colombia including the first account of the nesting of the Cock of the Rock. According to Mulsant and Verreaux¹ he returned to Colombia after 1848 where he died. Although known chiefly as a botanical collector, he collected many zoölogical specimens including insects and a series of scorpions and probably sent to Europe many of the Colombian birds that were described by contemporary French ornithologists. It is possible also that under his instructions the natives learned to collect birds for the European market and thus began the shipment of Bogota skins which later developed into such an extensive traffic to supply museums and the millinery trade.—T. S. PALMER.

Unusual Dearth of Winter Birds.—Judging by my own experience at Hatley, and that of friends and correspondents in such widely scattered places as Toronto, Montreal, Boston, Philadelphia and Washington, the winter season of 1917–18, will no doubt go down to posterity as a very remarkable one, not only for its great severity, but also for its great dearth of winter birds. Nothing like it has been seen in my time at Hatley and long previous to that so I am told by the oldest inhabitants, the thermometer standing for long periods at a time far below zero, even up to 20° and 30° in the day time and 45° at night. The local papers have contained notices of the great dearth of birds, and that from people not given to the study of Ornithology, but who perforce have had the matter thrust upon their attention. I myself have not seen any Redpolls, Pine Siskins, Pine or Evening Grosbeaks, the only birds in evidence being a few small flocks of Snow Buntings, and an occasional Northern Shrike, with a Goshawk on December 18. An easterly gale in the first week of December however, was responsible for driving in at least three Brünnich's Murres and one Ring-billed Gull, two of the former being taken at North Hatley on December 10, and one at Hatley on January 9, whilst the Gull was taken near Massawippi early in December, all of which birds I saw and identified in the flesh.—H. MOUSLEY, *Hatley, Que.*

¹ Histoire Naturelle des Oiseaux-Mouches, II, p. 66, 1876.

Correction.—In mentioning the 'Preliminary List of the Birds of Tennessee' in the January 'Auk,' p. 103, Mr. W. D. Howser was credited with the compilation and editing. We now learn that this labor was performed by Mr. A. F. Ganier, Curator of the Tennessee Ornithological Society.—WITMER STONE.

RECENT LITERATURE.

Chapman's 'Distribution of Bird-Life in Colombia.' — The appearance of Dr. Chapman's report on the 'Distribution of Bird-Life in Colombia' ¹ more than meets our expectations. We realize at once that it is the most important contribution ever made to the subject of which it treats but we further recognize in it the completion of a definite plan, clearly conceived and carefully carried out—an accomplishment that must be as much of a gratification to the author as it is to those who consult the volume. Too often, especially in America, important explorations have been made and extensive collections obtained which through force of circumstances remain unreported, except in so far as a series of 'preliminary descriptions' of new forms may be regarded as a report, which in their brevity, are often as much of a hindrance as they are a help to science.

Dr. Chapman assembled his collections, published his descriptions of new species with praiseworthy detail and now presents us with a comprehensive report of the entire investigation, with discussions, not only of the relationship of the birds but of the varied characters of the country they inhabit — its forests, rainfall and other environmental conditions, and finally his deductions as to the limits of the present day life zones of Colombia, their history and the probable origin of the bird-life of the country. Needless to say this is no small task especially when we read that: "so indefinitely is the physiography of the country diversified that our entire time in Colombia might have been devoted to a single mountain range and still not have given us the information needed to map its zones and faunas with a thoroughness which would begin to express all the facts and factors involved," and the author modestly adds: "we must therefore, leave to future workers the task of filling in the details. . . with a hope that they will find the zonal and faunal boundaries here proposed at least fundamentally correct." This hope we are sure will be more than realized.

¹ The Distribution of Bird-Life in Colombia. A Contribution to a Biological Survey of South America. By Frank M. Chapman. Bull. Amer. Mus. Nat. Hist., Vol. XXXVI, 1917. pp. i-x, 1-729; plates I-XLI; text figures, 1-21. New York, 1917.

Up to this time the writers on Colombian ornithology have based their studies almost entirely upon the collections of others, mainly natives, who furnished no information regarding the country in which the specimens were obtained — usually not even definite localities, so that no intelligent consideration of the range or distribution of the species was possible. Dr. Chapman began his investigation in 1911 with a personal trip from Buenaventura on the Pacific coast to Baranquilla on the Caribbean Sea, traversing nearly the whole length of the country down the Cauca and Magdalena Valleys, and crossing two of the three ranges of the Colombian Andes, while two years later he made another trip to the Bogota region, crossing the third range to Villavicencio at its eastern base. He thus obtained an intimate personal knowledge of the country as well as of its most characteristic birds, and was able to direct intelligently the operations of his assistants on the six additional expeditions which they conducted, so as to secure the most important returns; while by his personal association with his men in the field on the two trips above mentioned, he was able to instruct them in the object of the explorations and the best methods by which they might be attained.

Bogota, as is well known, has been since about 1838 a shipping point for bird skins. While these were primarily intended for millinery purposes many found their way into the hands of ornithologists in France and England and hundreds of new species were described with Bogota as their type locality. Of later years it has become evident that most of these specimens did not come from the immediate vicinity of Bogota at all but were brought there by natives who secured them at various more or less remote spots often in quite different life zones or faunas. The determination of the actual habitat of such species became, therefore, a primary necessity in working out the distribution of bird-life in Colombia, and in ascertaining the proper relationship of the species and subspecies, and this led to Dr. Chapman's careful investigation of this critical region — a piece of work which in itself is a contribution of the first importance to neotropical ornithology. We cannot within the limits of this notice consider in detail the numerous interesting problems of local distribution presented by Dr. Chapman, but a few of his more general conclusions may be stated. In the first place he considers that the remarkable similarity in the fauna of the Pacific Tropical zone in Colombia and Ecuador, and that of the Amazonian forest, indicates that these regions, now totally separated, are parts of a formerly continuous area and that their fauna is pre-Andean. The evolution of new forms has here, he contends, been practically at a standstill and therefore many species occur on both sides of the mountains today showing no differentiation. The tremendous upheaval of the Andean chain on the other hand has been responsible for the rapid evolution of a host of new forms in accordance with the great changes in topography in the area affected.

Above the tropics Dr. Chapman recognizes three zones: the Subtropical; the Temperate; and the Paramo. The fauna of the first has been derived

from the Tropical zone immediately below while the species characteristic of the last two have originated in the same zones at sea-level farther south. Many of these species moreover range north over the entire temperate zone with little or no modification which should be expected, since they have nowhere left the peculiar environment of their original zone. Species of the Subtropical zone on the other hand have pushed up from their original Tropical zone into an entirely different environment with the result that they have in nearly every instance been materially modified. Or as Dr. Chapman puts it: "Uniformity of life increases with altitude." The Cauca Valley, the fauna of which differs decidedly from that of the humid Pacific coast, Dr. Chapman considers to have been under water until post-tertiary time so that its bird-life is of comparatively recent origin.

Another interesting fact brought out in the work before us is the curious break in the Subtropical forest zone, which extends along the Andes to northern Colombia and is then lacking until we reach the high mountains of western Panama and Costa Rica, where the same types, sometimes the very same species, reappear. This break Dr. Chapman calls the "Panama fault," and cites evidence to show that a former connecting range of high mountains, which carried the Subtropical zone over the present tropical interval, has been entirely reduced by erosion and subsidence in comparatively recent geological time.

The chapters treating of these and other distributional problems, with their host of original facts and faunal lists of species will be studied with the deepest interest by all zoögeographers, while the itineraries of the eight expeditions, illustrated as they are by numerous admirable photographs, are fascinating reading for anyone interested in travel and exploration.

The systematic portion of the report based upon the collection of 15,775 skins secured by Dr. Chapman and his assistants, treats of 1285 species and subspecies of which 22 new species and 115 new subspecies have been described by the author in the course of his studies of this extensive material. Most of these were described in previous papers but eleven appear in the present volume for the first time, while for convenience the earlier diagnoses are all reprinted here. One of the novelties discovered by the expeditions is named *Troglodytes musculus neglectus* (p. 520). This name, as has been pointed out to us by Dr. Charles W. Richmond, is pre-occupied by *Troglodytes neglectus* Brooks, an Old World form of Winter Wren, and it becomes desirable to give it a new name. It seems to us that *Troglodytes musculus chapmani* would be a fitting name for this Wren and we therefore propose this as a substitute for *T. m. neglectus* Chapman.

The various species in Chapman's report are numbered in accordance with Brabourne and Chubb's 'Birds of South America.' The synonymy includes a reference to the original description of the species with type locality, and other references to its occurrence in Colombia. This is followed by critical remarks upon range and relationship and a list of localities from which specimens were secured. Dr. Chapman estimates that the whole number of Colombian birds would be about 1700. While we fully

appreciate his motives in limiting his list strictly to species which were encountered by his expeditions, we cannot but regret — even though our attitude be admittedly selfish — that he did not in some way include at least the land birds reported by others from Colombia, thus making his report monographic. The knowledge of the relationships of such forms, which he must have acquired in working up his collections, would have been of the greatest value to others.

The best test of a work of this kind is the actual use of the volume and having had occasion recently to study two neotropical collections, from adjacent areas, in which study Dr. Chapman's work was extensively used, the writer can testify to the admirable style of its arrangement and to its thorough accuracy.

As regards nomenclature, Dr. Chapman adopts subspecies rather more liberally than most recent writers — that is to say, he treats certain forms as subspecies which others would regard as of full specific rank. This is a practice of which we thoroughly approve, since to our mind a name should be made to express as much as possible, and if one form is clearly a derivative of another, the trinomial appellation showing this relation carries more information than would the binomial, while the fact that actual intergradation between the two has not been proven is not of sufficient importance to warrant an expression in nomenclature. In regard to genera, Dr. Chapman expresses himself at some length against their undue multiplication and rejects *Eupsychortyx* as not separable from *Colinus*; and *Dictiopicus* as not distinct from *Dryobates*. While here again we are in sympathy with our author's attitude it seems that while sacrificing the above mentioned genera, he retains quite a number apparently not any better differentiated. This question must probably be settled by convention as genera are matters of opinion and their relative importance cannot be settled by any criterion or rule. The opinion of one author is probably as good as that of another and all will differ to some extent.

There are many other portions of this admirable work upon which we are unable here to comment — the discussion of climate and precipitation and their influence on the formation of life zones; the formation of the cloud forests; the various faunas into which the zones are divided, etc. Enough has been said however, to show the comprehensive character of the work, and the broad way in which the subject is handled.

Mention must however, be made of the numerous excellent maps and distributional charts and the four attractive colored plates from paintings by Louis Agassiz Fuertes, who accompanied Dr. Chapman upon the two expeditions in which he took part — also the energy and ability of the corps of collectors to whose efforts the success of the several expeditions was largely due: W. B. Richardson, Leo E. Miller, Arthur A. Allen, Geo. K. Cherrie, Paul G. Howes, Geoffroy O'Connell, Thos. M. Ring, and Howarth Boyle.

This volume is entitled "A Contribution to a Biological Survey of South America." We feel sure that it will be the wish of every naturalist who

reads it, that when this terrible war is over and Dr. Chapman resumes his ornithological work, he may be able to prepare other similar contributions for which much material is already available at the American Museum. Surely no one today is better equipped for the task.— W. S.

Gee and Moffett's 'Birds of the Lower Yangtse Valley.' — This little volume,¹ apparently reprinted from the columns of a newspaper, is a well prepared account of the more common birds of the region of which it treats, intended to meet the needs of those who wish to become familiar with the wild bird life of China. There is a good description of each species with an outline of its general distribution, an account of its nest and eggs and some general notes on its habits and history. The material is compiled from various reliable sources and includes as well the observations of the authors and those of the late Dr. Paul D. Bergen.

"The greatest lack in ornithological literature of China," say the authors, "is not the scientific descriptions of species — perhaps few remain yet to be described — but the sort of careful popular study that has taught us so much of the intimate ways of the birds of America and England." As an attempt to fill this want the present work is a very praiseworthy effort, and will be welcomed alike by those who are able to study Chinese birds on the spot and those in far away lands, who wish to know something of the everyday familiar birds of this interesting country.— W. S.

Mathews' 'Birds of Australia.' — Part six² of volume six of this notable work is now before us, completing the treatment of the Parrots. Eight species of the genera *Neonannodes*, *Neophema*, *Lathamus*, *Melopsittacus*, *Pezoporus* and *Geopsittacus* are figured and described. There is also an appendix giving the description of *Platyercus elegans fleuriensis* Ashby, already published in 'The Emu,' and some supplementary notes by the describer. Also a correction in which the generic name *Suavipsitta* (p. xix) is proposed for *Nannopsittacus* Matthews, preoccupied by *Nannopsittaca* Ridgway.

In the main text of this part we find the following new name proposed: *Neonannodes chrysostomus cyanopterus* (p. 446), Victoria.— W. S.

Kalmbach on the Crow and its Relation to Man. — The continued demand for information regarding the economic value of the Crow and the exhaustion of the supply of previous bulletins on the subject, have resulted

¹ A Key to the Birds of the Lower Yangtse Valley with Popular Descriptions of the Species Commonly Seen. By N. Gist Gee, Soochow University and Lacy I. Moffett, Kiangyin. Shanghai: Shanghai Mercury Limited, Print. 1917. pp. 1-221, with index (i-xix) and errata (iii-iv).

² The Birds of Australia. By Gregory M. Mathews. Vol. VI, Part VI. December 11, 1917.

in a new investigation by Mr. E. R. Kalmbach,¹ Assistant Biologist of the Biological Survey. A large amount of new and more recent information has been collected through correspondence and the number of stomachs upon which conclusions on the food habits of the bird are based, has increased from 909 at the time of the previous report to 2118.

The matter is clearly and concisely presented under various headings and the results and conclusions summarized at the close of the report. The omnivorous habits of the Crow and the resulting complexity of the problem of determining its worth to man can readily be appreciated when we learn that no less than 656 different items were detected in the stomachs examined. After carefully weighing all the factors in the case, Mr. Kalmbach concludes that while the Crow undoubtedly does much damage in destroying corn and other crops, poultry, nestlings and eggs of wild birds, etc., nevertheless the enormous amount of good that it does in destroying noxious insects, especially in the early spring, when they are at the lowest ebb of their life cycle, constitutes a benefit that we cannot afford to dispense with. Therefore he considers that while the bird should not be protected no efforts directed toward its extermination should be tolerated. In other words it should be kept at about its present abundance and should be allowed to be shot whenever it is found doing damage.

In the Delaware Valley, according to the reviewer's experience, there seems no doubt but that the Crow has decreased considerably during recent years, owing apparently to the molestation of the roosts, and if this condition prevails over other parts of its range, it may be that by the time another report on the bird's economic value appears, it will be necessary to give it some measure of protection. Ornithologists would be sorry to see a bird of such varied interest and historical association, seriously reduced in numbers, when there is no more call for such action than Mr. Kalmbach has shown, and we sincerely hope that his practical recommendations will be accepted throughout the country.

This excellent report is illustrated by an admirable colored plate of the Crow from a painting by the author, a map of the United States locating 174 Crow roosts, and a diagram showing graphically the food of the Crow throughout the year.—W. S.

Arthur's 'Birds of Louisiana.' — This list published as a 'Bulletin of the State Department of Conservation'² is issued in response to the demands of schools, nature teachers and others interested in extending a knowledge of the wild birds of the state. Mr. Arthur has done his work well, giving us an authoritative list of species according to the A. O. U.

¹ The Crow and its relation to Man. By E. R. Kalmbach. U. S. Dept. of Agriculture, Bulletin No. 621. February 16, 1918. pp. 1-92.

² The Birds of Louisiana. Bulletin 5, State of Louisiana, Department of Conservation, M. L. Alexander, Commissioner. [By Stanley Clisby Arthur, Ornithologist.] pp. 1-80. New Orleans, January 1918, with several maps and other text figures.

'Check-List,' with the several local vernacular names and brief comments on the time of occurrence, relative abundance, habits and more important color marks. No less than 368 species and subspecies are listed in this pamphlet, an increase of forty-five over the list of Messrs. Beyer, Allison and Kopman, published in 'The Auk' (Vols. XXIII, XXIV and XXXII).

An introduction of eight pages considers the history of Louisiana bird life, migration and other general topics, while a number of small maps and half-tone text figures illustrate this interesting and welcome publication.—W. S.

Murphy on the Natural History of the Mexican Portion of the Colorado Desert.¹—Mr. Murphy made two trips into this interesting region in March 1915, for the purpose of securing specimens of the Lower Californian Pronghorn and other desert animals for the museum of the Brooklyn Institute. In the present paper he presents some general information about the region, an exceedingly interesting and well illustrated narrative of his trips and an annotated list of the birds, as well as some account of the Pronghorn.

The list of birds comprises 134 species and includes besides those observed by Mr. Murphy, a number of others which were secured or observed by Mr. Samuel N. Rhoads on a trip through this country in 1905 (Proc. Acad. Nat. Sci. Phila., 1905, pp. 679–690). Mr. Murphy's excellent paper forms a valuable supplement to Dr. Grinnell's recent report on the fauna of the Lower Colorado Valley, farther north.—W. S.

Batchelder on New Birds from Newfoundland.²—An examination of a considerable series of Ovenbirds and Yellow Warblers taken during the breeding season in Newfoundland, has convinced Mr. Batchelder that they are separable subspecifically from individuals from the rest of eastern North America, and he therefore proposes for them the names, *Seiurus aurocapillus furvior* (p. 81) and *Dendroica æstiva amnicola* (p. 82) respectively. In a general way these new forms are darker in coloration than the 'typical' races.

The establishment of very slightly differentiated geographical races in the east will soon bring us face to face with some of the problems that have troubled our friends in California and other parts of the west, in the matter of sight identifications. The advent of a "Brown-headed Chickadee" in the eastern states a year ago, which could not be subspecifically identified without collecting the specimen, caused great speculation as to how observations on the bird should be recorded and as these Newfoundland Oven-

¹Natural History Observations from the Mexican Portion of the Colorado Desert. By Robert Cushman Murphy. Abstract Proc. Linnean Soc. of New York, Nos. 24–25, 1917. pp. 43–101, plates I–VI.

²Two Undescribed Newfoundland Birds. By Charles Foster Batchelder. Proc. New England Zool. Club, VI, pp. 81–82. February 6, 1918.

birds and Yellow Warblers in all probability pass down our Atlantic coast in migration we shall in future be in doubt as to which form we have seen. Meanwhile it will be interesting for those who have good series of migrant specimens to see whether they can detect the new forms among them.—W. S.

Murphy on a New Albatross.¹—Under the name *Diomedea sanfordi* (p. 861), Mr. Murphy describes a single specimen of an Albatross secured at sea forty miles off Corral, Chile, by R. H. Beck who was engaged in obtaining specimens for the Brewster-Sanford Collection. The specimen is compared at length with *D. exulans* and the difference in the structure of the nostril is so great that in Mr. Murphy's opinion the two should be separated subgenerically, and he therefore erects the subgenus *Rhothonia* (p. 861) for his new species.

Whether Mr. Murphy compared his specimen with *D. chionoptera* Salv. we do not know but in the last number of the 'Bulletin' of the British Ornithologists' Club, Lord Rothschild, in commenting upon Mr. Murphy's paper, identifies his new species with this latter form, citing records to show that it ranges widely after the breeding season which would make its occurrence off the coast of Chile not unlikely.—W. S.

Shufeldt on Fossil Birds from Vero, Florida.²—This is an elaboration of a previous report on the same material published in 'The Journal of Geology' for January-February, 1917, pp. 18-19, and already noticed in these columns. A reference to the present publication seems desirable in order to prevent future complications by calling attention to the fact that the new species described in the former paper all appear as "sp. nov." in this one as well, and may easily be quoted from it in mistake. Such practice is decidedly reprehensible. As the present paper is dated July 20, 1917, at the end of the text, it would seem that the author had ample time to give the proper references to the earlier publication had he so desired.—W. S.

Publications on Bird Protection.—From the Winter Number of 'Bird Notes and News' we learn that Venezuela has passed a law to stop the killing of Egrets for their plumes, limiting the traffic to cast feathers. In England great damage has been done to the native birds by the indiscriminate destruction of both birds and eggs by members of the 'Sparrow Clubs' which were organized for the purpose of reducing the numbers of the House Sparrows but whose activities, through ignorance, were extended to other species as well.

¹ A New Albatross from the West Coast of South America. By Robert Cushman Murphy. Bull. Amer. Mus. Nat. Hist., Vol. XXXVII, pp. 861-864. December 10, 1917.

² Fossil Birds found at Vero, Florida, with Descriptions of New Species. By R. W. Shufeldt. Ninth Ann. Rep. Fla. State Geol. Survey, 1917, pp. 35-42.

'California Fish and Game' for January tells of the successful use of bombs and fireworks in frightening migrant birds from the rice fields and has an admirable article on the value of wild birds by Mr. J. G. Tyler.

The 'Report of the Chief of the Bureau of Biological Survey' of the U. S. Department of Agriculture contains brief mention of investigations as to the food habits of the Starling which indicate that this bird has some desirable qualities and is not all bad. The question remains however, whether in spite of his destruction of ground insects he is not from sheer force of numbers crowding out of existence many of our native species in areas inhabited by him. Another pamphlet issued by the Biological Survey 'How to Attract Birds in the East Central States' is by W. L. McAtee and is similar to those already published for other sections of the country. The 'Audubon Bulletin' of the Illinois Audubon Society for the winter of 1917-1918 and the 'Seventh Annual Report of the New Jersey Audubon Society' are full of interesting matter concerning bird protection and bird study in these states and the former has an anonymous biographical sketch, with portrait, of Mr. Robert Ridgway, which will be read with great pleasure by everyone interested in the development of ornithology in America.

'Current Items of Interest' prepared by Mr. Henry Oldys contains an account of a Sparrow campaign at Davenport, Iowa, which seems to have been more successful than the English one already mentioned.

Cornell University has issued a circular announcing courses of instruction on wild life conservation and game breeding during 1918, while from the National Association of Audubon Societies come some attractive 'Audubon Pocket Bird Collections'—clever colored drawings by E. J. Sawyer of mounted specimens, represented as in a case with a 'catalogue' on the back arranged by Dr. Frank M. Chapman.

The 'Report of the National Zoölogical Park' contains an interesting note on the park as a bird sanctuary and a list of some 180 species of birds now living in the collection.—W. S.

Swarth on Jays of the Genus *Aphelocoma*.¹—The much discussed California Jays are again reviewed in this paper with the result that *Aphelocoma c. obscura* of the A. O. U. 'Check-List' is found to be identical with typical *A. californica* from Monterey but the bird of interior California generally supposed to be *californica* is different and is the same as *A. c. immanis*, described from Linn Co., Oregon, by Dr. Joseph Grinnell. All this seems to hinge upon the question as to which of two forms a type from somewhat intermediate territory belongs, and we have no doubt Mr. Swarth's deductions are correct. We would therefore be still in accord with the 'Check-List' so far as the number of races of *A. californica* is concerned were it not for the fact that Mr. Swarth comes to the conclusion

¹ The Pacific Coast Jays of the Genus *Aphelocoma*. By H. S. Swarth. University of California Publ. in Zool., Vol. 17, pp. 405-422. February 23, 1918.

that the birds from the coast region north of San Francisco Bay are different from either of the above. These he separates as *A. californica oocleptica* (p. 413), type locality Nicasio.

He also differs from Dr. Oberholser's recent conclusion that *A. hypoleuca* is merely a race of *A. californica*, as maintained in the A. O. U. 'Check-List,' and would give it full specific rank. The facts in regard to this group would seem to be now before us and any difference of treatment must be due to personal opinion.—W. S.

Wetmore on *Palæochenoides mioceanus* Shufeldt.¹—This name was based upon the fossilized distal end of the right femur of a bird which Dr. Shufeldt considered as related to the Anseres. Quoting from Dr. Shufeldt's paper we find "that this femur never belonged to any bird at all related to *Sula*, or to any of the Herons, or to *Pelecanus*, all of which have femora possessed of some characters, which, though not of wide difference, are quite sufficient to constitute discriminating ones, and to point to the fact that this great extinct fowl did not belong in any of those groups, as we know them, osteologically."

Now comes Mr. Wetmore with the results of another careful examination of this same bone fragment and we read that of five characters of the femur "*Palæochenoides* agrees with the *Steganopodes* in four, while in only one does it approach the Anseres...and it is referred without question to the *Steganopodes*." He further suggests that it was a Pelican-like bird of a somewhat generalized type showing resemblances to the Gannets and remotely to the Cormorants and Darters.

It would seem desirable that those who name fossil birds should not fashion their generic names on those of existing birds as it is embarrassing to find them shifted into other families or orders where the name becomes somewhat of a misnomer!

Mr. Wetmore's argument in the present case seems much the more convincing of the two that have been presented.—W. S.

Economic Ornithology in recent Entomological Publications.—

Some interesting original observations of the relations of birds to insect pests have recently been published by entomologists. They relate to the following insects:

Potato aphid (*Marcosiphum solanifolii*). This new pest, because of the thoroughness and insidiousness of its attacks, is popularly known as the "Kaiser bug" in Ohio where it destroyed many potato fields. The following birds were observed actively feeding on the aphids: Chipping Sparrow, Quail, and English Sparrow.²

¹ The Relationships of the Fossil Bird *Palæochenoides mioceanus*. By Alexander Wetmore. The Journal of Geology, XXV, No. 6, Sept.-Oct., 1917.

² Houser, J. S., Guyton, T. L. and Lowry, P. R., Bull. 317, Ohio Agr. Exp. Sta., Nov. 1917, p. 80.

The sweet-potato leaf-folder (*Pilocrocis tripunctata*). This Pyralid moth larva was found to be very injurious to sweet potatoes near Brownsville, Texas. Mr. M. M. High who studied it there, states that the Boat-tailed Grackle, feeds upon this species among "a number of insects that attack truck crops and particularly on larvæ.... Observed it first feeding on the cabbage looper (*Autographa brassicæ* Riley) in 1913, two days after cabbage had been sprayed with an arsenical. Some species of larvæ after being poisoned have a habit of crawling to the top of the leaves of the plant upon which they are feeding before dying, and here they fall easy prey to the grackle. The poison apparently does not seriously affect the birds, since none have been found dead in the vicinity of sprayed crops." ¹

The pecan-leaf case-bearer (*Acrobasis nebulella*). The larva of this Phycitid moth is a serious pest in the southern part of the pecan growing district. "Three species of birds — the Blue Jay,.... Mockingbird,.... and the Orchard Oriole.... — have been observed feeding upon the larvæ of the pecan-leaf case-bearer. These birds, as well perhaps as those of other species, do much to check the ravages of this pest, and their protection in the pecan orchard should be encouraged. The Blue Jay very likely is more beneficial than harmful to the pecan grower. In the writer's opinion the good that this bird does in feeding upon injurious pecan insects more than offsets the injury that it is accused of doing in the fall of the year, when it may take a few nuts from the pecan trees." ²

The fall webworm (*Hyphantria textor*). The facts concerning the seriousness and ubiquity of this pest need no restatement. Dr. C. Gordon Hewitt informs us that, "The study of the natural control of the fall webworm was extended to Nova Scotia in 1916, and it is interesting to record that of the different factors operating in the reduction of this insect the Red-eyed Vireo, *Vireosylva olivacea* L., appears to be the most important. It was estimated that about 40 per cent of the larvæ had been destroyed in the webs by this bird at the five observation points." ³ Other really effective bird enemies of the fall webworm, on the basis of their record in the United States are the Yellow-billed Cuckoo and Baltimore Oriole.

The emperor moth (*Samia cecropia*). This large moth, while attracting considerable attention on account of its size can hardly be classed as a pest. Dr. Hewitt's comment on its bird enemies, nevertheless, is of interest. "Studies in the natural control," of this moth, he says, "have been made, and.... it was found that most of the cocoons were destroyed by woodpeckers" (op. cit., p. 9).

West Indian mole cricket (*Scapteriscus vicinus*). In a recent important bulletin ⁴ on this "most serious pest of general agriculture in Porto Rico,"

¹ In Bull. 609, U. S. Dept. Agr., by Thos. H. Jones, Nov. 22, 1917, p. 9.

² Gill, J. B., Bull. 571, U. S. Dept. Agr., Dec. 15, 1917, pp. 14-15.

³ Rep. Dominion Entomologist, 1917, p. 8.

⁴ Van Zwaluwenburg, R. H., Bull. 23, Porto Rico Agr. Exp. Sta., Feb. 12, 1918, pp. 18-19.

full consideration is given to bird enemies. Wetmore's account¹ of the subject is quoted almost in full and the statement made that "The most efficient enemies of the changa are to be found among the native birds."—W. L. M.

Protection of Military Carrier-Pigeons.—An interesting article² by Professor Henri Blanc, informs us that the Military and Interior Departments of the Swiss government in 1915 demanded that a warfare be carried on throughout Switzerland against birds of prey capable of destroying Carrier Pigeons in flight with messages. In following this order some of the cantons offered bounties of as much as four francs per bird. From Sept. 11 to Dec. 13, 1915, Professor Blanc states, 86 hawks were presented for identification at the museum of which he is curator. Among these were 11 *Cerchneis tinnunculus* and 17 *Buteo vulgaris* which are deemed especially useful species. Examination of the stomachs of some of these birds revealed only small rodents in those of the former species and large grasshoppers and small rodents in those of the latter.

Examination of the stomachs of *Accipiter nisus*, *Astur palumbarius* and *Falco peregrinus* yielded only remains of small birds, and in one case of a chicken. "On the basis of these autopsies," the author says, "one must conclude that the rapacious birds killed in the canton of Vaud in 1915 have not done the assumed damage to the carrier pigeons of the army." The total number of birds of prey killed in Switzerland in 1915 was 806, of which 506 were *Accipiter nisus*, 159 *Astur palumbarius* and 35 *Falco peregrinus*. This is a very high percentage (more than 80) of destructive bird hawks, and shows greater success in restricting slaughter to these species than has been attained in similar campaigns in the United States.

A recent issue of the Official Bulletin³ informs us that the United States army also is losing some of the carrier pigeons in training, but from another cause. The Bulletin says "Any pigeon in the air may be a carrier pigeon flying from a loft under government supervision. Its destruction may be a serious loss to the American Army. All persons therefore, are urged to refrain from the shooting of pigeons and to discourage the practice." The birds bear bands with the legend "U. S. A.—18" and persons coming into possession of any birds so marked are requested to report the fact to the Chief Signal Officer, Land Division, Washington, D. C.—W. L. M.

Birds Probably not Distributors of Hog Cholera.—The following is quoted from the Annual Report of the Chief of the Bureau of Animal Industry, U. S. Department of Agriculture for 1917 (p. 48). "The belief that birds play an important part in the spread of hog cholera led to some

¹ Bull. 326, U. S. Dept. Agr., 1916, pp. 9, 10, 21, 31, 32.

² Destruction des Oiseaux rapaces diurnes dans le canton de Vaud et en Suisse pendant l'année 1915. Bull. Soc. Vaud. Sci. Nat., 51, 1917, pp. 315-319.

³ Washington, D. C. Feb. 5, 1918, p. 8.

experiments with pigeons. Suitable pens were prepared facing each other, and the space between was inclosed by wire netting. The front of each pen was left open, so that pigeons which were placed in the inclosed space between the pens could have easy access to the pens on either side. In one pen pigs sick of cholera were kept and in the other there were healthy, nonimmune pigs. When the sick pigs died they were replaced with others, so that the disease was kept constantly present in one of the pens, and this pen was not cleaned during the course of the experiment. The healthy pigs were changed from time to time. The pigeons constantly flew from the infected pen to the opposite pen containing the well pigs, which was only 10 feet distant. In the different experiments healthy pigs were exposed to infection through the medium of the pigeons for from 30 to 40 days. In no case was the disease transmitted by the pigeons, although it is evident that every opportunity was afforded for this to occur. The exposed pigs were proved susceptible by subsequent exposure to cholera. While these experiments can not be said to prove that it is impossible for pigeons to carry hog cholera, it seems fair to conclude that the disease is probably not often carried from one farm to another in that way."

These experiments under conditions much more favorable to the transmission of the disease than ever occur in actual hog raising practice, would seem to indicate that birds, not carrion-feeders, probably never distribute the causative agent of hog cholera on their feet or other parts of their bodies. The relations of the carrion feeders to the disease have previously been discussed in 'The Auk,'¹ and evidence adduced that they have little importance in spreading stock diseases. Nevertheless a violent campaign has been waged against buzzards and crows especially in farm journals, in southern states, and protection has been denied buzzards by legislative enactment in Alabama, Louisiana, South Carolina, Tennessee, and Texas. All this on a suspicion which was controverted by facts available at the beginning of the campaign, and which the evidence since accumulated still further discredits.—W. L. M.

The Ornithological Journals.]

Bird-Lore. XX, No. 1. January-February, 1918.

Photographs of Falkland Island Bird-Life. By Rollo H. Beck.—These are some of the pictures which appeared recently in the 'American Museum Journal' but they do not compare with the latter in quality of printing.

'Pauperizing' the Birds. By Henry Oldys.—A clever article discussing the possibility of diverting birds from insect diet by the introduction of feeding stations. The evidence is against such a theory, so that we may go on providing food with a clear conscience.

¹ 30, No. 2, April 1913, pp. 295-8.

A New Feeding Slab. By W. E. Saunders.—A slab that English Sparrows will not frequent.

The articles on migration and plumages treat of the Tanagers with a colored plate by Fuertes, in which by the way, the female and winter males of the Scarlet Tanager are altogether too yellow. The usual Christmas lists cover twenty-six pages, while exactly half of the magazine is devoted to reports of Audubon Societies.

The Condor. XX, No. 1. January–February, 1918.

The Barrow Golden-eye in the Okanagan Valley, B. C. By J. A. Monroe.

The Destruction of Birds at the Lighthouses on the Coast of California. By W. A. Squires and H. E. Hanson.

Early Autumn Birds in Yosemite Valley. By Joseph Mailliard.

A Note on the Tracheal Air-sac in the Ruddy Duck. By Alexander Wetmore.

Notes on Some Birds from Central Arizona. By H. S. Swarth.

A Return to the Dakota Lake Region. By Florence Merriam Bailey.

Breeding Birds of Bexar County, Texas. By R. W. Quillin and Ridley Holleman.

Wilson Bulletin. XXIX, No. 4. December, 1917.

A Day with the Birds of a Hoosier Swamp. By B. W. Evermann.

Keeping Field Records. By A. F. Gainer.

The Saving of a Pond and the Resulting Bird List. By Howard C. Brown.

Winter Birds about Washington, D. C. By W. L. McAtee, E. A. Preble and Alexander Wetmore.—Forty-eight species seen on December 30, 1916.

Another Unusual Laying of the Flicker. By B. R. Bales.—Thirty-nine eggs in the same number of days.

The Oölogist. XXXV, No. 1. January, 1918.

Ivory-billed Woodpecker not Extinct. By J. B. Ellis. One pair seen at Everglade, Florida in the spring of 1917.

The Buffle-head in the Okanagan Valley, B. C. By J. A. Monroe.

The Ibis. X Series, VI, No. 1. January, 1918.

Notes on *Embernagra platensis* and its Allies, with the Description of a new Species. By Charles Chubb.—*Embernagra gossei* (p. 9), Lujan, Mendoza, Argentina.

Index-List of the Coloured Plates of Birds in 'The Ibis,' 1859 to 1917. By Dr. E. Hopkinson.

Notes on the Nidification of Some Indian Falconidæ. The Genera *ICTINÆTUS* and *MICROHIERAX*. By E. C. Stuart Baker.

Erythrism in Birds' Eggs. By E. C. Stuart Baker.

On Birds Recently Collected in Siam. Part I. Phasianidæ — Eurylæmidæ. By C. Boden Kloss.—Sixteen new species and subspecies are described.

The Platycercine Parrots of Australia: A Study in Colour-change. By Gregory M. Mathews.

Rejection by Birds of Eggs unlike their own: with Remarks on some of the Cuckoo Problems. By C. F. M. Swynnerton.

Bulletin of the British Ornithologists' Club. No. CCXXVIII. Mr. E. C. Stuart Baker describes five new Bulbuls.

Mr. Charles Chubb describes *Scytalopus simonsi* (p. 17), Choquecamate, Bolivia; *Leptoptila intermedia* (p. 17), Central south Peru; *Columba anolaimæ* (p. 17), Anolaima, Colombia; and *Gymnopelia ceciliæ gymnops* (Gray ms.) (p. 18), Challapata, Bolivia. *Parus flavipectus carruthersi* (p. 19); Samarkand, and *Herpornis xantholeuca interposita* (p. 20), Teman-goh, Upper Perak, are described by Dr. Hartert.

Mr. P. F. Bunyard discusses the effect of the unusually severe winter of 1916-1917 on the birds.

Bulletin of the British Ornithologists' Club. CCXXIX. December 29, 1917.

Lord Rothschild describes *Turtur afer sclateri* (p. 26), Entebbe, Uganda; and Dr. Hartert, *Anthreptes hypogrammica intensior* (p. 27), Sarawak, Borneo and three forms of *Edolisoma*, while Mr. Charles Chubb proposes six new Tinamous, four Doves and Pigeons and two Rails from various parts of South America as well as *Conopophaga aurita occidentalis* (p. 34), from eastern Ecuador.

Bulletin of the British Ornithologists' Club. CCXXX. January 28, 1918.

Mr. E. C. Stuart Baker describes *Prinia inornata herberti* (p. 39), Bangkok; and Mr. Charles Chubb *Attagis gayi fitzgeraldi* (p. 40), Horcones Valley, Argentina, and *A. g. simonsi* (p. 41), Lake Titicaca, Peru.

British Birds. XI, No. 7. December, 1917.

Occurrence of the Buff-backed Heron in Norfolk. By F. W. Smalley. John Hunt. Part II. By Hugh S. Gladstone.

There is a lengthy discussion on the number of races of the Puffin and their nomenclature.

British Birds. XI, No. 8. January, 1918.

Notes and Observations on the Moor-Hen. By Frances Pitt.

The Moults and Sequence of Plumages of the British Waders. By Annie C. Jackson. Part IV.—Lapwing, Turnstone, Upland Plover, Ruff and Sanderling.

British Birds. XI, No. 9. February, 1918.

On the Breeding Habits of the Hobby. By M. Ashley.

Notes on the Relation between Moults and Migration as observed in some Waders. By Annie C. Jackson.—Unfortunately the Sanderling was not one of the species selected for study by Miss Jackson. In our experience it moults more freely in migration than any of the others but probably it would not alter the general conclusions reached.

C. J. Alexander. Obituary.

Avicultural Magazine. IX, No. 2. December, 1917.

Several Papers on Old World Vultures, wild and in captivity.

Variation in Colour of Wild Geese. By M. Paul.

- Avicultural Magazine.** IX, No. 3. January, 1918.
 Photograph of a running Apteryx.
 Popular Accounts of Bird-life in Australia.
- The Emu.** XVII, Part 3. January, 1918.
 Fleurieu Peninsula Rosella. By Edwin Ashby.— With a colored plate.
 An Introduction to the Study of the Penguins on the Nobbies, Phillip Island, Western Port, Victoria. By Dr. Brooke Nichols.— With remarks on the validity of *Eudyptula undina*.
 Ornithologists in North Queensland. By Capt. W. Macgillivray. Part II.
 Notes upon Eggs of the Wedge-tailed Eagle (*Uroæetus aulax*). By H. L. White.
 Two Singing Species of Gerygone. By A. H. Chisholm.
 Bird Notes from New South Wales. By Dr. E. A. D'Ombrian.
- The South Australian Ornithologist.** III, Part 4. October, 1917.
 Birds on the River Murray. By A. M. Morgan.
- The South Australian Ornithologist.** III, Part 5. January, 1918.
 Birds of Port Broughton. By A. M. Morgan.
 G. M. Mathews' article on Birds of the North and North-west of Australia and the Sketch of the Life of Samuel White, run through both numbers.
- Revue Française d'Ornithologie.** No. 103. November, 1917. [In French.]
 The Rearing of the Ostrich in Madagascar. By C. Riviere.— Completed.
 Anomalies and Individual Variation in Birds. By E. Anfric.— Concluded.
- Revue Française d'Ornithologique.** IX, No. 104. December, 1917.
 The Supposed Return to the Nest of Migrating Birds and the Instability of their Residence. By Dr. F. Cathelin.
 A Study of the Variation in Plumage in *Halcyon albicillus* and *Chloropsis hardwicki*. By J. Berlioz.

Ornithological Articles in Other Journals.¹

- Beck, Rollo H.** Narrative of a Bird Quest in the Vicinity of Cape Horn. (American Museum Journal, January, 1918.) Concluded in the February number.
- Job, H. K.** Game Farming for Pleasure and Profit. (*Ibid.*)
- Allen, Arthur A.** Photography and Ornithology. (American Museum Journal, February, 1918.)

¹ Some of these journals are received in exchange, others are examined in the library of the Academy of Natural Sciences of Philadelphia. The Editor is under obligations to Mr. J. A. G. Rehn for a list of ornithological articles contained in the accessions to the library from week to week.

Beebe, William. A Second Imperial Parrot. (N. Y. Zoölogical Society Bulletin, January, 1918.)

Clarke, W. Eagle. Wild Life in a West Highland Deer Forest. (Scottish Naturalist, December, 1917.)

Criddle, Norman. The Red-tailed Hawk in Manitoba. (Ottawa Naturalist, October, 1917.)

Monro, J. A. Notes on the Winter Birds of the Okanagan Valley. (*Ibid.*, November, 1917.)

Tinsley, H. G. The Elusive Blue Quail of Texas. (Forest and Stream, March, 1918.)

Allen, A. A. Preserving Black Duck and Canvasback. (Bull. Amer. Game Protective Assoc., October, 1917.)

Job, H. K. The Audubon Society Experiment Station. (*Ibid.*)

How a Ruffed Grouse Drums. By F. K. Vreeland. (*Ibid.*, January, 1918.) — A series of excellent photographs.

Oberholser, H. C. Description of a New Subspecies of *Perisoreus obscurus*. (Proc. Biol. Soc. Wash., Vol. 30, December 1, 1917.) — *P. o. rathbuni* (p. 185). Lake Crescent, Washington.

Bangs, O. Vertebrata from Madagascar. Aves. (Bull. Mus. Comp. Zoöl., LXI, No. 14, February, 1918.) — An annotated list of 110 species. *Oena capensis aliena* (p. 491); *Phalacrocorax africanus pictilis* (p. 500); *Anhinga vulsini* (p. 501) and *Agapornis madagascariensis ablectanea* (p. 503) are described as new.

Hartert, Ernst. On the Crested Larks of the Nile Valley. (Novitat. Zool., Vol. XXIV, No. III, December, 1917.)

Hartert, Ernst. Notes on Pheasants. (*Ibid.*) — Complete list of genus *Phasianus*.

Hartert, Ernst. A Few Notes on the Birds of Yemen. (*Ibid.*) — *Anthus sordidus arabicus* (p. 457); *A. s. sokotrae* (p. 457); *Cisticola cisticola arabica* (p. 458); *Parisoma blanfordi distincta* (p. 459); *Monticola rufocinerea sclateri* (p. 459).

Hartert, Ernst. The Subspecies of *Cyanopica cyanus*. (*Ibid.*) *C. c. interposita* (p. 493) Tai-pai-shan, Tsin-ling Mts.

Hartert, Ernst, and **Goodson**, Arthur. Further Notes on South American Birds. (*Ibid.*) *Cymbilanius lineatus intermedius* (p. 495) Rio Madeira, Brazil; *Thamnophilus punctatus interpositus* (p. 496) "Bogota"; *Th. doliatus tobagensis* (p. 497) Tobago; *Th. bernardi baroni* (p. 498) Yonan River, Peru; *Synallaxis unirufa meridana* (p. 498) Andes of Merida, Ven.; *Sclateria naevia trinitatis* (p. 499) Trinidad; and *Pseudocolaptes boissonneantii meridæ* (p. 499) Vale of Merida, are described as new.

Pettitt, E. E. Some Further Notes on the Cuckoo. (Wild Life, IX. No. 11-12, November and December, 1917.) — Contains numerous half-tones and popular articles on birds.

Stephens, T. C. Birds of the Past Winter, 1916-1917, in Northwestern Iowa. (Proc. Iowa Acad. Sci., XXIV.)

Gabrielson, Ira N. A List of the Birds Observed in Clay and O'Brien Counties, Iowa. (*Ibid.*) — 136 species.

Bennett, W. Notes on Bell's Vireo. (*Ibid.*) — Observations on 13 nests and other data, illustrated by half-tones, two of which, by the way, are printed upside down.

Rintoul, L. J. and Baxter, E. V. Autumn Displays in our British Birds. (Scottish Nat., November, 1917.)

Decher, H. K. The Evening Grosbeak in Greater New York. (Proc. Staten Isl. Asso. Arts and Sci., VI).

Davis, W. T. Interesting Work of the Woodpeckers. (*Ibid.*)

van Someren, V. G. L. A Rare Forest Francolin (*Francolinus lathamii schubotzi*). (Jour. E. Afr. and Uganda Nat. Hist. Soc., VI, March, 1917.)

Loveridge, A. A Natural History Expedition through the Kedong Valley, B. E. A. (*Ibid.*) — Interesting narrative full of bird notes.

Baker, E. C. Stuart. The Game Birds of India, Burma and Ceylon. (Jour. Bombay Nat. Hist. Soc., XXV, No. 2, September, 1917.) — Genus *Gennæus*; very full discussion.

Donald, C. H. The Raptores of the Punjab. (*Ibid.*)

Delacour, Jean. Resistance of Exotic Birds to Cold. (Bull. Soc. Nat. Acclim. France, 64 ann., August, 1917.) [In French.]

Larcher, O. Contribution to the History of Female Birds which have developed the External Characters of the Male. (*Ibid.*) [In French.]

Delacour, Jean. On *Schizorhis cristata*. (*Ibid.*, September, 1917.)

Willett, George. Notes on Some Mollusc-eating Birds. (Lorquinea, II, pp. 33-36.)

Oberholser, H. C. New Light on the Status of *Empidonax traillii* (Audubon). (The Ohio Jour. of Science, January, 1918.) The type proves to be the eastern race, so that *E. t. alnorum* becomes a synonym of *E. t. traillii* and the "Traill's Flycatcher" of the west being left without a name is called *E. t. brewsteri* (p. 93), type locality, Cloverdale, Nevada.

Morgan, T. H. Inheritance of Number of Feathers of the Fantail Pigeon. (Amer. Nat., January, 1918.) — Figures the curious "split feathers."

Bretscher, K. Bird Migration in Central Switzerland in Relation to Meteorological Conditions. (Nov. Mem. Soc. Helvet. Sci. Nat., Vol. 51, Mem. 2.) [In French.] — A Review of this interesting paper will be found in 'Nature,' for September 20, 1917. While Dr. Bretscher does not consider temperature the inciting cause of migration, he claims for it considerable influence on the progress of the flight.

Publications Received.—**Anderson, R. M.** Report of the Southern Division in Canadian Arctic Expedition, [with two other reports] pp. 1-56 (reprinted and repaged from the Report of the Naval Service for the fiscal year ending March 31, 1917).

Arthur, S. C. The Birds of Louisiana. Bulletin 5, Department of Conservation, pp. 1-80. January 19, 1918.

Batchelder, C. F. Two Undescribed Newfoundland Birds. Proc. New England Zool. Club, VI, pp. 81-82. February 6, 1918.

Chapman, F. M. Audubon Pocket Bird Collection Cases Nos. I-IV. Price 10 cents each, Nat. Asso. Audubon Societies.

Chapman, F. M. The Distribution of Bird-Life in Colombia; a Contribution to a Biological Survey of South America. Bull. Amer. Mus. Nat. Hist., Vol. XXXVI, 1917, pp. i-x + 1-729.

Geo, N. Gist and Moffett, Lacy I. A Key to the Birds of the Lower Yangtse Valley. Shanghai, 1917, pp. 1-221 + index.

Hartert, Ernst. (1) On Some Rallidæ. (Novitates Zoologicæ, Vol. XXIV, pp. 265-274, May, 1917.) (2) Notes on Game-Birds. (*Ibid.*, pp. 275-292, May, 1917.) (3) Some Further Notes on *Anthreptes malaccensis*. (*Ibid.*, p. 323, May, 1917.) (4) Notes and Descriptions of South American Birds. (*Ibid.*, pp. 410-419, August, 1917.) (5) On the Forms of *Coturnix coturnix*. (*Ibid.*, pp. 420-425, August, 1917.) (6) *Scolopax rusticola mira*. (*Ibid.*, p. 437, August, 1917.)

Hollister, N. Report of the Superintendent of the National Zoölogical Park for the Fiscal year ending June 30, 1917. (Ann. Rept. Smithson. Inst. for 1917, pp. 71-87.)

Kalmbach, E. R. The Crow and its Relation to Man. Bull. 621, U. S. Dept. of Agric., February 16, 1918, pp. 1-92, price 15 cents.

Mathews, Gregory M. The Birds of Australia. Vol. VI, pp. 445-516 + i-xix. Part VI, December 11, 1917.

McAtee, W. L. How to Attract Birds in the East Central States. Farmers' Bull. 912, U. S. Dept. Agric., February, 1918, pp. 1-15.

Murphy, Robert C. (1) A New Albatross from the West Coast of South America. (Bull. Amer. Mus. Nat. Hist., Vol. XXXVII, pp. 861-864, December 10, 1917.) (2) Natural History Observations from the Mexican Portion of the Colorado Desert. (Abstr. Proc. Linn. Soc. N. Y., No. 24-25, 1917, pp. 43-101.)

Nelson, E. W. Report of Chief of Bureau of Biological Survey, pp. 1-16 (repaged from the Ann. Reports of the Dept. of Agriculture.)

Shufeldt, R. W. (1) Fossil Birds Found at Vero, Florida, with Descriptions of New Species. (Ninth Annual Report Florida State Geol. Survey, pp. 35-42, 1917.) (2) Anomalies of the Animal World — Parts VI and VII. (Scient. Amer. Supplement, Nos. 2196, February 2, 1918, and 2192, January 5, 1918.) (3) Western Quails Being Exterminated. (Amer. Forestry, Vol. 23, No. 285, September, 1917, pp. 565-566.) (4) Two Fine Collections of Mounted Birds (Nat. Humane Review, Vol. VI, No. 2, February, 1918.)

Swarth, H. S. The Pacific Coast Jays of the Genus *Aphelocoma*, Univ. of Calif. Publ. in Zool., Vol. 17, No. 13, pp. 405-422, February 23, 1918.

Wetmore, Alexander. (1) The Relationships of the Fossil Bird, *Palæochenoides mioceanus*. (Journal of Geology, XXV, No. 6, September-October, 1917, pp. 555-557.) (2) A New Honey-eater from the Marianne Islands. (Proc. Biol. Soc. Washington, pp. 117-118, May 23, 1917.) (3) On the Fauna of Great Salt Lake. (American Naturalist, Vol. LI, December, 1917, pp. 753-755.)

Abstract Proceedings Linnæan Society New York. Nos. 28-29, 1915-1917 (December 11, 1917), pp. 1-114.

American Museum Journal, XVII, No. 8 and XVIII, Nos. 1 and 2, December, 1917-February, 1918.

Audubon Bulletin, Winter 1917-1918, Illinois Audubon Society, pp. 1-48.

Avicultural Magazine, (3), IX, Nos. 2-3, and 4, December, 1917-February, 1918.

Bird Notes and News, VII, No. 8, Winter, 1917.

Bird-Lore, XX, No. 1, January-February, 1918.

British Birds, XI, No. 7, 8, and 9, December, 1917-February, 1918.

Bulletin American Game Protective Association, Vol. 7, No. 1, January, 1918.

Bulletin British Ornithologists' Club, Nos. CCXXVIII, CCXXIX and CCXXX, December 4, 1917-January 28, 1918.

Bulletin Charleston Museum, XIII, Nos. 7 and 8, XIV, Nos. 1 and 2, November, 1917-February, 1918.

California Fish and Game, IV, No. 1, January, 1918.

Condor, The, XX, No. 1, January-February, 1918.

Cornell University Official Publication, IX, No. 4, January 15, 1918.

Emu, The, XVII, Part 3, January, 1918.

Fins Feathers and Fur, No. 12, December, 1917.

Forest and Stream, LXXXVIII, Nos. 1, 2 and 3, January-March, 1917.

Ibis, The, (10) VI, No. 1, January, 1918.

New Jersey Audubon Society, Seventh Annual Report, October 2, 1917.

Oölogist, The, XXXIV, No. 12, XXXV, Nos. 1, 2, and 3, December, 1917-March, 1918.

Ottawa Naturalist The, XXXI, Nos. 7, 8 and 9, October-December, 1917.

Philippine Journal of Science, The, XII, Sect. D., Nos. 4 and 5, July and September, 1917.

Records of the Australian Museum, XI, No. 12, November, 1917.

Revue Française d'Ornithologie, Nos. 103, 104, and 105, November-January, 1918.

Science, N. S., Nos. 1198-1210.

Scottish Naturalist, The, No. 72, December, 1917.

South Australian Ornithologist, The, III, Parts 4 and 5, October, 1917, and January, 1918.

Wilson Bulletin, The, XXIX, No. 4, December, 1917.

Zoological Society Bulletin, XXI, No. 1, January, 1918.

CORRESPONDENCE.

EDITOR OF 'THE AUK':

Anent "sight" records, the following has come to my attention and seems to be worthy of presentation. It is not a joke, but we have here the untrained observer who is sure of what he has seen and records the details minutely. I quote the letter verbatim, written under date of December 11, 1917:

"On the 9th of December between 1:30 and 2 o'clock, under bright sunny conditions and with temperature around 10 or 15 degrees above zero, I was taking photographs in the village of —— Rockland County. Mr. ——, artist, of —— and Mr. ——, farmer, of —— were with me at the time and support my statement from their own independent observations.

"We saw several times, two male scarlet tanagers. They did not seem to be disturbed by the cold but flew around from tree to tree apparently seeking food. There could be absolutely no mistake as it was in an open country with only scattered trees and a fresh fall of snow on the ground that brought their bright plumage out in strong contrast. . . . I wish to emphasize the fact that there could be no doubt as to these birds as I am familiar with the birds, seeing them almost yearly in the woods around —— in the spring of the year and I saw them several times that morning for a period of twenty minutes to half an hour and at a distance varying from fifty to a hundred feet. Mr. —— and Mr. —— will be very glad to submit statements if you care to have them. You can do what you care to with this statement."

Comment is almost superfluous. The writer did not know that the Scarlet Tanager in autumn changes his red coat for a yellow-green one so that the birds he saw could not have been of this species. Most of us can guess what he really did see, but that is just what is the matter with so many "sight" records. Truly "a little knowledge is a dangerous thing."

Yours truly,

JONATHAN DWIGHT.

New York, Feb. 1, 1918.

[The undersigned has already presented the "sight" record problem to the readers of 'The Auk' (1917, p. 373), and to the members of the A. O. U. at the last stated meeting. He hoped for some suggestions—some approval or criticism of the tentative solution he offered, but no one seems inclined to discuss the question. Even Dr. Dwight in presenting this interesting and instructive example, fails to offer any advice. It should not be difficult for any editor to reject this record but there are others just as erroneous where the fault is by no means so easily detected.—W. S.]

NOTES AND NEWS.

WALTER REAVES ZAPPEY, an Associate of the American Ornithologists' Union, was born in Roxbury, Massachusetts, May 6, 1878, the son of Christian and Augusta Reaves Zappey. He early showed a keen interest in animal life, particularly in birds, and as a boy spent much time in the woods, hunting, trapping, and observing. When about nine years old he moved with his parents to Roslindale, Massachusetts, then a rather thinly settled part of the community, where he had easy access to the woods and fields, and brought home various live creatures as pets. During this time he attended the public schools of Boston, and eventually took up work in taxidermy with the Frank Blake Webster Co., of Hyde Park. In February, 1902, he was sent by Mr. Webster to the Isle of Pines, Cuba, to make zoölogical collections for the Hon. Walter Rothschild of London. This was the first of his collecting trips, from which he returned in the early summer of the same year. In the following spring he made a second expedition to the Isle of Pines for Mr. Outram Bangs of Boston, and was successful in securing an exceptionally fine and well prepared collection of birds, on which a report was published by Mr. Bangs and himself (*American Naturalist*, 1905, vol. 39, p. 179-215). It was on this trip that he also secured the specimens of the Isle of Pines representative of the Cuban *Capromys pilorides*, one of which was made the type of the subspecies *C. relictus*.

In December 1906, his services were obtained as a collector in the interests of the Museum of Comparative Zoölogy, to accompany Mr. E. H. Wilson, the botanist, on an expedition into the interior of China. He reached Shanghai in February, 1907, and spent most of his first year in the region of Ichang, whence he sent home a fine collection of vertebrates. The second year he travelled with Mr. Wilson in their house-boat up the Yang-tze to Kiating, thence overland, through the Province of Szechuan to the Tibetan border. He collected in many localities where no white man had been seen before, and made a particularly valuable collection of birds, mammals, and reptiles on the isolated Wa Shan range. A general report on his Chinese collections, with accounts of sundry new species appeared in the *Memoirs of the Museum of Comparative Zoölogy*, Vol. 40, 1912. In returning home from China, he came via the Indian Ocean and Red Sea, to England, arriving in Boston in May, 1909, thus completing a journey around the globe.

In October of the same year, he again set forth, this time with Mr. Childs Frick of Pittsburgh, to British East Africa, to be gone eight months. Although the main object of the expedition was large game, he made an excellent collection of small birds and mammals, which were given by Mr. Frick to the Museum of Comparative Zoölogy, while most of the larger specimens were presented to the Carnegie Museum at Pittsburgh.

After his return from Africa, he began work as preparator at the Museum of Comparative Zoölogy, and showed much skill in mounting and renovating skins. A valvular trouble of the heart had already made its appearance but did not seem alarming.

He was married on October 26, 1910, to Miss Nellie L. Krook, of Reading, Mass., and resided at Arlington and Cambridge up to the time of his death from valvular heart disease, February 20, 1914. There were no children.

As an energetic and intelligent field collector, skilful preparator, and cheerful companion, Walter Zappey will long be remembered by those who knew him.—GLOVER M. ALLEN.

ROWLAND GIBSON HAZARD of Peace Dale, R. I., an Associate of the American Ornithologists' Union since 1885, died of heart disease at Santa Barbara, Cal., January 23, 1918. Mr. Hazard was born in Philadelphia, Pa., January 22, 1855, the son of Rowland and Margaret Anna (Rood) Hazard of Rhode Island. He was graduated from Brown University, receiving the degree of A. B. and A. M. from his Alma Mater. At the time of his death Mr. Hazard was President of the Peace Dale Manufacturing Company, and a Director of several other large corporations — both manufacturing and financial. He possessed a fine ornithological library and although engrossed in business never lost his interest in birds. He contributed many notes to 'The Auk' on Rhode Island birds from 1884 to 1908 and published an interesting account of the 'Breeding habits of the King Penguin (*Aptenodytes longirostris*)' in the October, 1894, number, pp. 280-282. Mr. Hazard was a genial whole-souled gentleman and a delightful man to meet. He was a Fellow of Brown University and a member of the Authors' Club of London.—J. H. S.

GEORGE BATTEN, Associate member of the Union since 1911, and one of the pioneer advertising men of New York, died February 16, 1918, at his home in Montclair, New Jersey, after an illness of several months. He was the son of Thomas Gaskill and Emeline Lane Batten, and was born on a farm in Gloucester, New Jersey, June 19, 1854. He is survived by his wife, who was Miss Lillie I. Shivers, and five children, Rollins M., Joseph L., George Jr., Mrs. A. Y. McNeill, and Miss Emeline Batten.

Although he has written comparatively little on ornithology, he always has taken a keen interest in the science and in out of door sports with rod and gun. As president of the New Jersey Audubon Society during the years 1911-1915 he was active in developing it to the high standard of efficiency which it now enjoys.

The conservation of wild life appealed to him, and as president of the Association of New Jersey Sportsmen, he was active in bringing about legislation for its protection and increase.

Mr. Batten was always actively interested in farming and live stock breeding, and was owner of a herd of pure bred Jersey cattle.

At the age of twenty years he began his business career and in 1891 laid the foundation of a concern which later was destined to develop into one of the leading advertising establishments — The George Batten Company — with branches in New York, Boston, and Chicago. As a member of the 1st Regiment National Guards of Pennsylvania, he served in the Pittsburgh riots.

He was director of the American Jersey Cattle Club, life member of the New York Agricultural Society, president of the Jersey Cattle Association of New Jersey, member of American Game Protective Association, president of Montclair Chapter of the Sons of the American Revolution, member Colonial Society of Philadelphia, member Montclair Club, Montclair Art Association, Outlook Club, Montclair Golf Club, Advertising Club of New York and the Sphinx Club. A very good portrait of him may be found in *Bird-Lore* for 1914, page 522.

He was a man of high ideals, sound judgment and pleasing personality, a combination of virtues which won for him many friends, who recognize in his death a serious loss.— A. K. F.

DR. JAMES CLARKE WHITE, an Associate of the American Ornithologists' Union since 1913 was not a professional naturalist but throughout a busy life as a physician never lost altogether the keen interest in natural history of his early days. Born in Belfast, Maine, July 7, 1833, the fifth of seven children of James Patterson and Mary Ann Clarke White, sturdy New Englanders, he spent a boyhood in the healthy surroundings of a quiet Maine town, picking up an education in the local schools and finally entering Harvard College in 1849. He spent many leisure hours in the college library, where he attracted the attention of the librarian Thaddeus William Harris, on account of the frequency with which he asked for works on natural history. He was keenly interested in the Harvard Natural History Society, then a flourishing undergraduate association, with a small museum, in which a collection of stuffed birds was one of the chief exhibits. Of this collection he was "Curator" and writes that he spent much time in mounting on perches the specimens he had shot during his summer vacations. After his graduation at the age of twenty, he determined to study medicine and enrolled at the Tremont Medical School of Boston, obtaining his medical degree in 1856. He was the first American medical student to study at Vienna, where he took up the investigation of diseases of the skin and laid the foundation for his later eminence as a specialist in this branch of medicine. In 1857, he began a general medical practice in Boston, and in 1871 was made Professor of Dermatology at the Harvard Medical School, a position which he filled until his resignation in 1902. He married Martha Anna Ellis of Boston, in 1862, and was survived by two of his three sons.

Although he took no active interest in ornithology in his later years, he was an honored member of the Boston Society of Natural History, and

from 1858 to 1868 was Curator of Comparative Anatomy in its museum, where he arranged the large Lafresnaye collection of birds.

Dr. White died January 5, 1916, at Boston, an honored and eminent member of his community, and an example of the class of physician-naturalists, who in a former generation were largely responsible for the progress of natural science.—GLOVER M. ALLEN.

ERIC BROOKE DUNLOP, an Associate of the American Ornithologists' Union, was killed in action in France, May 19, 1917. He was thirty years of age.

He was the son of Arthur B. Dunlop of The Hove, Frontbeek, Windermere, England, and was educated at Rugby. From early boyhood he had devoted himself to the study of birds and prepared an appendix to Macpherson's 'Fauna of Lakeland.'

In 1913 he came to Canada and was located at Winnipeg where he continued his studies and made contributions to 'The Auk' and 'British Birds.' He enlisted in 1915 in the 78th Canadian Grenadiers but in England transferred to the Border Regiment. He reached France barely a month before his death.—W. S.

HENRY JUSTICE, an associate of the American Ornithologists' Union, died at Philadelphia on March 1, 1918, in his seventy-fourth year. Mr. Justice came of old Colonial stock and his father, Wm. W. Justice, an intimate friend of John G. Whittier, was a conspicuous figure in Pennsylvania antislavery agitation.

While Mr. Justice was for many years engaged with his brother in the wool business, he was deeply interested in the study and preservation of the native birds, and was an active member of the Pennsylvania Audubon Society.—W. S.

FOREIGN MEMBERS OF THE A. O. U.—The foreign members of the American Ornithologists' Union comprise two groups, Honorary Fellows, elected on account of their eminence in ornithology, and limited to 25, and Corresponding Fellows limited to 100. These limitations were fixed at the founding of the Union and have never been changed. The two classes (known prior to 1902 as Honorary and Corresponding Members) correspond to the Honorary and Foreign Members of the British Ornithologists' Union but are considerably broader since the number of Honorary Members in the latter is restricted to 10 and the number of Foreign Members to 20. In addition to these, Colonial Members of the B. O. U., limited to 10, are placed in a special class.

At the first meeting of the A. O. U., 21 Honorary Members were elected and four months later, on January 17, 1884, the first loss occurred through the death of the veteran ornithologist Hermann Schlegel. At the second meeting the list was filled and remained at the limit for more than five years when a vacancy occurred in January, 1890, through the death of Taczanowski. Since then the list has never been full and in 1911 the number

declined to 11. Up to the present time 45 Honorary Fellows have been elected of whom 16 are still living. Of these Dr. Otto Finsch, Mr. F. D. Godman and Count Salvadori were elected at the first meeting in 1883. The others have been transferred at various times from the Corresponding list since it is now the custom to elect a foreign member first as a Corresponding Fellow. The Honorary list of the A. O. U. includes some of the most eminent ornithologists of modern times. Among those now deceased will be found the names of Berlepsch, Cabanis, Huxley, Milne-Edwards, Alfred Newton, W. K. Parker, Schlegel, P. L. Sclater, Sharpe, and Wallace, while among those still living are several names equally well known. The only American ever elected to the Honorary class was the late George N. Lawrence.

Unlike the Honorary list the class of Corresponding Fellows has never been filled although the total number of individuals elected has been 127. At the first meeting 20 were elected and at the second meeting the number was increased to 77 but apparently several failed to qualify as the secretary reported only 65 at the opening of the third meeting, although no deaths had then occurred. Seven years later, in 1892, the list reached its maximum of 74, in 1895 it fell below 70, and since 1911 has been less than 60 through losses both by death and by transfer.

Of the total 127 thus far elected 17 have been promoted to the Honorary list and 2 to the list of Active Members. Seventy-one are still living; 57 are now Corresponding Fellows, 13 are on the Honorary list and one is a Retired Fellow. One third of the present number have been on the list more than 30 years,— eight elected in 1883, 10 in 1884 and 3 in 1886. At various times 11 Americans have been elected as Corresponding Fellows. Of these, Dr. Abbott, Carriker, Chamberlain, ex-Governor Dole and Prof. Worcester are still on the list, Dr. Stejneger is a Retired Fellow, and the other 5, Bryant, Cooper, Prentiss, Scott (an Active Member 1886-1895), and Woodhouse are now deceased.

Since its organization 143 foreign ornithologists have been associated with the Union either as Honorary or Corresponding Fellows. In 1885, when the Honorary list was filled and there were more Corresponding Members than Associates, the foreign members formed nearly 44 per cent of the total number. Now the membership of the Union has increased nearly five fold and the foreign members constitute only about 7 per cent of the total number.— T. S. P.

CALLED TO THE COLORS.— Since the first list of A. O. U. members in military service appeared in the January number of 'The Auk,' a number of additions as well as changes in rank and station have come to our notice. It seems desirable therefore to reprint the preliminary list with the necessary corrections and additions.

ADAMS, DR. Z. B., Brookline, Mass., Amer. Exped. Forces. In France.
ANTHONY, H. E., New York City. 1st Lieut., 309th Field Artillery, Camp
Dix, Wrightstown, N. J.

- BABCOCK, DR. H. L., Dedham, Mass. Lieut., Med. Reserve Corps.
- BAKER, JOHN HOPKINSON, Dayton, O. Lieut., School for Aerial Observers, Fort Sill, Okla.
- BEEBE, C. WILLIAM, New York City. Capt., American Flying Corps.
- BOYLE, HOWARTH STANLEY, New York City. In France.
- BROOKS, ALLAN, Okanagan Landing, B. C. Major, Second Army School of Scouting etc., British Expeditionary Forces in France.
- BROOKS, WINTHROP SPRAGUE, Boston, Mass. Ensign in the Navy.
- BURLEIGH, THOMAS D., Pittsburg, Pa. Y. M. C. A. Army & Navy Association. In France.
- CHAPIN, JAMES PAUL, New York City. 1st Lieut., 309th Infantry, Camp Dix, Wrightstown, N. J.
- DERBY, DR. RICHARD, New York, N. Y. Major, Amer. Exped. Forces. In France.
- EASTMAN, F. B. Major, 344th Infantry, Camp Grant, Rockford, Ill.
- DUNLOP, ERIC B., Winnipeg, Man. Canadian Border Regiment. Killed in action, March 19, 1917.
- FAY, SAMUEL PRESCOTT, Boston, Mass. 1st Lieut., Artillery, Camp Devens, Ayer, Mass.
- GOLDMAN, EDWARD ALFONSO, Washington, D. C. Major, Sanitary Corps, National Army. In France.
- GRISCOM, LUDLOW, New York City. 2d Lieut., Infantry, Leon Springs, Texas.
- HAGAR, JOSEPH ARCHIBALD, Newtonville, Mass. 2d Lieut., Infantry, Camp Devens, Ayer, Mass.
- HARPER, FRANCIS, Washington, D. C. 1st Company Officers Training School, Camp Meade, Md.
- HOLT, ERNEST GOLSAN, Washington, D. C. 1st Company Officers Training School, Camp Meade, Md.
- KITTREDGE, JOSEPH, JR., Missoula, Mont. 1st Lieut., 10th Engineers (Forest). In France.
- LAING, HAMILTON MACK, Portland, Ore. No. 170004 R. F. C., Jesse Ketcham School, Toronto, Ontario.
- LEWIS, HARRISON F., Yarmouth, N. S. Sergeant Major, No. 6 Special Service Co., Canadian Expeditionary Force, Halifax, N. S.
- MABBOTT, DOUGLAS C., Washington, D. C. Marine Corps, Paris Island near Charleston, S. C.
- MARX, EDW. J. F. Capt. Battery B, 16th Field Artillery, Camp Greene, N. C.
- MATTERN, EDWIN S. Camp Meade, Md.
- MCCOOK, PHILIP JAMES, New York, N. Y. Major, Governor's Id., N. Y.
- MEYER, MISS HELOISE, Lenox, Mass. Red Cross. In France.
- MEYER, G. RALPH. Captain C. A. C., Ft. Kamehameha, H. I.
- PEPPER, DR. WILLIAM. Major, Medical Reserve Corps, Ft. Oglethorpe, Ga.
- ROBINSON, WIRT. Colonel, U. S. Military Academy, West Point, N. Y.

- PETERS, JAMES LEE, Harvard, Mass. 2d Lieut., Quartermaster's Corps, Jacksonville, Fla.
- PHILLIPS, DR. JOHN CHARLES, Wenham, Mass. Medical Corps, Fort Benjamin Harrison, Indianapolis, Ind.
- SANBORN, COLIN CAMPBELL, Evanston, Ill. Battery C, 149th U. S. Artillery, Fort Sheridan, Ill.
- SCHAEFER, OSCAR FREDERICK, Geneva, N. Y. 10th Engineers (Forest). In France.
- SCHAEFER, V. F., Geneva, N. Y. Amer. Exped. Forces. In France.
- SHELTON, ALFRED C., Eugene, Ore. Pathologist Base Hospital, Camp Lewis, American Lake, Wash.
- SHUFELDT, DR. ROBERT WILSON, Washington, D. C. Major, Medical Corps, Army Medical Museum, Washington, D. C.
- SMITH, LESTER WHEADON, Meriden, Conn. First Class Seaman, Naval Reserve. In France.
- STIMSON, DR. ARTHUR M., Washington, D. C. Sanitary Officer, 2d Naval District, War College, Newport, R. I.
- STORER, TRACY IRWIN, Berkeley, Calif. Co. G, 363d Infantry, Base Hospital, Camp Lewis, American Lake, Wash.
- YOUNG, JOHN P., Youngstown, O. Captain, 5th Co., C. A. C. Fort Hancock, Sandy Hook, N. J.
- WOOD, GEORGE B., Phila., Pa. Amer. Exped. Forces. In France.

Relatives or friends who may have additional information concerning these or other members are requested to communicate with the Secretary giving any facts as to rank, branch of the service or present location of members in military service in order that necessary corrections in the list may be made from time to time.

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T. S. Palmer,
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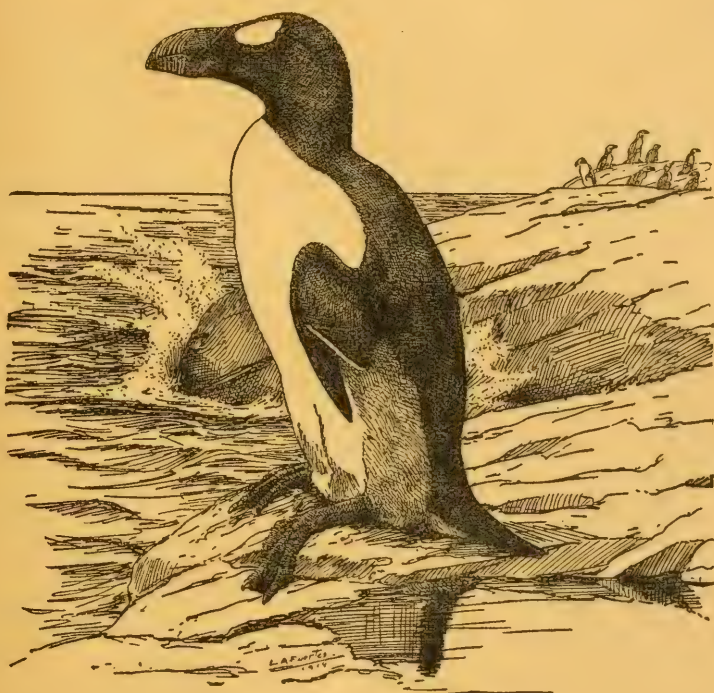
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A Quarterly Journal of Ornithology

Vol. XXXV

JULY, 1918

No. 3



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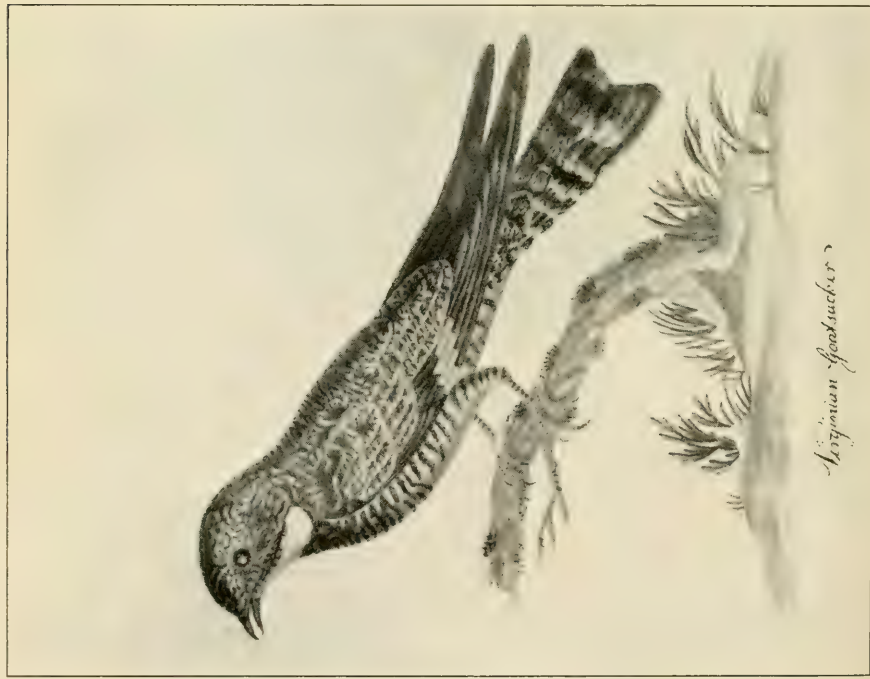
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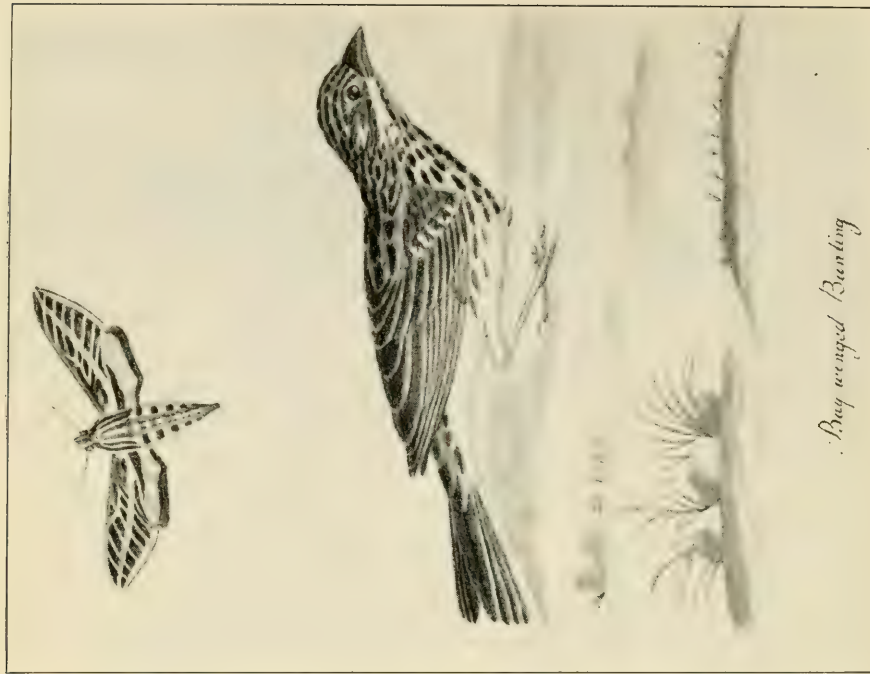
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Virginia Goldfinch



Bay-winged Bunting

THE AUK:

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JULY, 1918.

No. 3.

GEORGIA'S RARITIES FURTHER DISCOVERED IN A
SECOND AMERICAN PORTFOLIO OF
JOHN ABBOT'S BIRD PLATES.

BY SAMUEL N. RHOADS.

Plate IV.

IF the expectant reader of this article will examine volume XIII of 'The Auk' for the year 1896 he will find, on page 204, the following title of a paper by Walter Faxon, 'John Abbot's Drawings of the Birds of Georgia'. I have worded my own subject to "carry on," as it were, an amplification of what was there published more than twenty years ago.

In brief, Dr. Faxon describes, with considerable minuteness, "a set of 181 water color sketches of birds," owned by the Boston Society of Natural History and labeled "Drawings of the Birds of Georgia by John Abbot." How the Society secured these was not known. They appear to have been originally classified, as a collection, by Abbot himself, and consecutively numbered from 1 to 200, Dr. Faxon inferring that nineteen of the original series had been lost. Abbot's handwriting, in pencil, consisting of names, largely in accord with the nomenclature of Wilson's 'Ornithology,' with memoranda of dimensions, migration data and color notes, appears on the plates, only one of which is inscribed (in ink) with Abbot's signature and the date, "1810."

Unfortunately there is no mention of *locality* data, and the proof that they depicted specimens of the birds of Georgia only, and not also of the closely adjoining regions of South Carolina, appears to rest in that case, quite as much as in the one about to be narrated, largely on circumstantial evidence. Undoubtedly the great majority are Georgia records but whether all could be accepted as such, without question, in a present-day check-list, is doubtful.

Dr. Faxon goes on to give some account of this really remarkable naturalist, as the collector, artist and author of the earliest illustrated monograph of American insects, that splendid folio work of two volumes in colors, depicting the 'Rarer Lepidopterous Insects of Georgia.' Abbot was fortunate in having, as his editor and patron, Sir John Edward Smith in this publication, which appeared in London in 1797.

If he had been equally fortunate in securing an ornithological patron he would have forestalled by from fifteen to forty-five years many of the discoveries made in United States ornithology during the notable period covering the activities of Wilson, Audubon and Bonaparte.

So much by way of introduction; now for my story.

In December, 1916, I stopped at Savannah for two or three days, en-route for Cuba. During my stay I had the long anticipated satisfaction of visiting "Wormsloe," the country seat and plantation of the late Wymerley J. De Renne, situated on the Isle of Hope, one of the coast islands about three miles from Savannah.

Here is located, in a fine old colonial mansion the greatest and best single collection of books, manuscripts and other literature relating to the State of Georgia, and fittingly named by Lieut. Wymerley Wormsloe De Renne, the son and literary successor of Mr. De Renne, "*The Wymerley Jones De Renne Georgia Library.*" I was kindly escorted thither by Mr. L. L. Mackall of Savannah, the enthusiastic and efficient librarian of this fine collection, who, knowing my special taste for nature studies, soon produced some very precious items in that line. Among these was a folio volume of exquisitely drawn and colored original delineations of the reptiles and batrachia of Georgia painted by and for members of the noted Le Conte family.

Some of these were the originals of published illustrations of articles in scientific journals of an early day and in Holbrook's Herpetology. A companion volume to this one, both in size and modern binding, contained the water-color sketches of birds, forming the subject of this article. Mr. Mackall was anxious to have the tentative identification of these, as being of John Abbot's authorship, verified, but it was not until January of the present year that they were sent to me for that purpose. In this examination I have naturally made the archives of the Academy of Natural Sciences of Philadelphia and the good offices of the Editor of 'The Auk' my chief assistants.

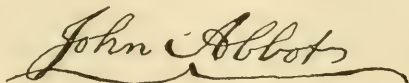
The folio volume containing these illustrations was bound for Mr. De Renne in three quarter red morocco, say about twenty years ago, possibly longer. The date and source of purchase unfortunately cannot now be ascertained.¹ On the back of the binding is printed in gold: — "*Birds of Georgia*"; and at bottom: — "1797." There is no other attempt, either inside or outside of the volume, to record its authorship, origin or subsequent history.

A set of thirteen manuscript sheets, written in ink and of very recent date describes each plate in detail by number and name, with remarks as to pose, etc. These, together with a library reference filing card, stating that "the artist was probably John Abbot," were laid within the volume.

There are one hundred and twenty-two hand painted sheets of uniform size, make and quality of heavy, hand made, plate paper, some slightly discolored by age and moisture, one torn into and mended and the last one of the series lacking a considerable part of the upper margin, not affecting the illustration but removing the legend probably written on its back as in all other sheets in the set. There are no watermarks in the paper, as in the Faxon set, to indicate age, but it is similar in make-up to old English plate paper of the last two decades of the eighteenth century, and this, together with the nomenclature used by the artist, indicate that these sketches were made several years prior to those described by Dr. Faxon. The sheets measure nine and one-half by thirteen inches and evidently have not been trimmed since they were painted upon.

¹ As this paper goes through the press I learn that the plates were purchased for \$100. from Geo. D. Smith, a well known dealer of New York City, on April 23, 1906.

The accompanying half-tone illustrations (Plate IV) from two of the best of Abbot's sketches in this series, together with a reproduction of the artist's signature at end of his letter to George Ord,



will give a fair idea of his work and his autograph. Owing to the English names of the birds, given by Abbot below each, being written in red ink it was necessary to trace them over carefully in black ink on the prints from which these half-tones were prepared. While this does not materially alter the character of the handwriting it does not do justice to the neatness and smooth finish of the originals. With some exceptions, to be noted in the check-list of figured birds at the end of this paper, Abbot has aimed to write along the upper margin (or top) of the reverse side of each a repetition of the English name, and below this the binomial, followed by "length" in "inches." This also is written with red ink, which, curiously enough, has the same sort of peculiar sanguine, pokeberry tint which adorns alike the Cardinal, Scarlet Tanager, Purple Finch, and Red-headed Woodpecker!

It should be stated that the numerical sequence of plates in this portfolio and their consecutive numbering in rather crude lead pencilling is evidently modern and with no regard to system, zoological or artistic, as the quoted list will show.

Certainly Abbot had no hand in this feature of the collection. That he was responsible for all the red ink chirography on these sheets is however readily proved by a comparison of it with the handwriting of his fine folio autograph letter to Ord in the archives of the Academy of Natural Sciences which was published in full in 'The Auk' (1906, p. 365) by Dr. Witmer Stone.

In a comparative analysis of the two bird portfolios it will be seen that, of the ninety-two species identified in the De Renne series, there are twenty-seven species not present in the set described by Faxon. There are also two unidentified hawks, Plates 27 and 59, one of them possibly representing an additional species. These two, for convenience of reference, are designated

by an asterisk (*) in the list given. The two Abbot portfolios therefore represent 174 species, presumably all of birds procured in Georgia, and, for a period of approximately 110 years ago, a remarkable showing in the annals of early American Ornithology, produced as it was by an Englishman who was primarily a hard working field entomologist, dependent thereon for his living and at the same time remarkable for his accurate and beautiful sketches of insects and the trees and flowering plants upon which they feed. As intimated by Faxon, the number of bird species is also noteworthy because of the small number of marine or tide water forms depicted, due, no doubt, to the distance of sixty miles or more separating Abbot's home in Screven County from the seacoast.

Of gulls and terns, only two species each are given. Of the Limicoline Shore-birds, so abundantly represented by species frequenting the coast line of the Southeastern States, all of Abbot's plates show but seven species of those peculiar to the coast and some of these are known to straggle inland along such a waterway as the Savannah River, near which our artist's home was located. Comparing again with Faxon's list, we note that the De Renne series numbers twenty-one Warbler species to sixteen: also in Flycatchers (*Tyrannidæ*) the ratio is four to one.

The De Renne series has thirteen plates of Hawks showing variations of probably eight species as against four species in the other series. The disparity in number of water-bird plates in the two folios is markedly in favor of the Boston Society's collection, being fifty-two to eleven. If our conjecture as to the Boston series being of later production is correct it is in accord with the natural trend of a collector's researches to go farther afield, and may be found to tally with Abbot's residence in or near Savannah for a period prior to his return to England.

It is unfortunate that Dr. Faxon did not publish at least a representative series of quotations from the pencil annotations which Abbot is stated to have made on his drawings, especially of the names or localities there given. One of the most interesting features of the collection here described is Abbot's nomenclature, both vulgar and technical, which I have taken pains to reproduce, without any alteration, and within quotation marks. It is desirable that some one, having access to the Boston Society's portfolio,

make a report on the noteworthy portions of those pencil notes which are said to lie in obscurity beneath the cryptic camouflage of Dr. T. M. Brewer. By so doing he may bring to light a few more secrets which time and patient research are adding to the real biography of the hermit naturalist of Georgia.

Some of Abbot's common names are recognizable as those of Catesby, Edwards and Pennant, his English models; a few are apparently quite local, as "Flax Bunting" for the American Goldfinch, "Cat Flycatcher" for the familiar Cat Bird, "Blue Warbler," not inaptly given to the Blue Bird, "Black Bunting" for Snowbird, "Pigeon Hawk" for Mississippi Kite, "Little Sparrow" for the "Chippy," etc. Some of the names are evidently Abbot's own for species he thought undescribed, "very rare," or that he could not identify: as "Barred-tail Sandpiper" for the Solitary species, "Black-rumped Sandpiper" for the Pectoral, "Yellow Warbler" for the Blue-winged Yellow, "Yellow-poll Warbler" for Chestnut-sided, "Georgia Wren" for Long-billed Marsh Wren and "Magnolia Warbler" for the Cape May species. His name of "Red-breasted Thrush" for our so-called "Robin" is worthy of universal adoption. His classing all the American "Starling" Blackbirds as "Oriole" strikes one nowadays rather strangely, though it has a more real and generic meaning than the vulgar name now applied to that group. It also seems a bit queer to think of Vireos as "Flycatchers," though Wilson so termed them while Audubon used the name as an alternative and more than half their food is flies or flying. We are not a little indignant, too, to find our familiar and much loved Song Sparrow damned by such faint praise as to be called the "Spotted breasted Sparrow"! No doubt a careful analysis of these English names would reveal much as to the artist's real sources of literary knowledge, both of books and persons. That he was in steady correspondence with English men of science is matter of record and no doubt some of his contemporaries abroad received from him the types and drawings of American birds, now recognized, which were there first described. His personal association with Alexander Wilson in Georgia is recorded by Ord, but to what extent the 'American Ornithology' is indebted to the discoveries of the Georgia naturalist may now be left to the research of others.

Faxon has referred to the work of Abbot from both artistic and scientific aspects and I fully agree with his conclusions. It may seem invidious to compare his bird sketches with those of Wilson, whose perfected illustrations have so long been over-praised by many, who, appreciating his literary and field work and his desperate struggles in the publication of his 'Ornithology,' have been unduly biased in his favor as an artist. Anyone examining the uncolored pencil and pen drawings which formed the great bulk of the originals which Wilson handed to his engraver, Alexander Lawson, will be convinced that Abbot's colored plates are in a different class. Several of Wilson's original sketches, or rough drafts, on scraps of paper, are mounted in a portfolio presented to the Academy of Natural Sciences of Philadelphia many years ago by the descendants of Lawson. In this, Lawson has mounted the Wilson drafts opposite a highly finished proof impression of the engraved plate in two states, the one, plain, on India paper, the other, carefully colored, on heavy plate paper. An examination of these will convince the most skeptical how much of the credit given the authors of illustrated works is rightly due to their engravers. Even Audubon was no exception to this. Abbot's great ability with the brush, as an off-hand colorist and at the same time a faithful recorder of seasonal and racial plumages in birds, is on a par with his work on moths and butterflies and their larvæ. Considering the difficulty of depicting, in natural pose and proportion, the mounted bird specimens which evidently were his models, as compared with copying from flat mounts of the *Lepidoptera*, it is surprising how well his portfolios were executed in one of the "Lost Towns of Georgia" at a period when the crude illustrations of ornithological literature had advanced little beyond those of the age of Linnæus. The remarkable similarity of make-up and style between Abbot's bird plates and those of George Edwards in his fine old color plate quartos of the 'Natural History of Birds,' begun in 1743, convinces me that the inspiration came from that publication more than any other, especially in view of the large number of American species which were there figured for the first time. We see in both the stereotyped accessories of the taxidermist,—a miniature tree, often leafless, decked with bits of moss and lichens, a conventional stand, or groundwork of grass patches,

moss, pebbles, frozen flowers, Dutch tulips, etc. On the margins, — sky, if you think so, — sports a curious fly or beetle, a gorgeous moth or even a bug or spider, in brilliant contrast to the sombre sparrow or blackbird that forms the centerpiece.

On the other hand, to compare Abbot's work to that of Audubon would be as far from the mark as to perpetuate the fallacy of making such comparisons between Audubon and Wilson. Of the three, Audubon alone was the real bird artist, revealing life, action, color, shade and landscape often in wondrous combination. As such, he was the greatest, and for many years, the only pioneer in artistic and natural illustration of faunal ornithology.

None of Abbot's birds in the De Renne portfolio show action, other than perfunctory woodpecking by a woodpecker, the eyeing of a green worm by the "Toupet Tit," the half opened wings of the "Red-winged Oriole" to display his epaulets, the inspection of a curious red fish by the Kingfisher, whose quizzical look is quite amusing, but not more so than that of the "Tyrant Shrike" in the garb of a Kingbird leaning over to inspect a green grasshopper seated upon the ground! Abbot had a curious and unaccountable trick of placing the pupils of his bird's eyes in a forward position. On this account, most of them may be said to be squinting or cross-eyed when there is no occasion for it. Not one in five has the pupil centered as is normally the case in nature. The plate of two Common Crossbills has the eyes centered but in other respects as to markings, pose, etc., it is the only one which does not seem to belong to the collection. Such a rare bird is this, in the lowlands of Georgia, and so crude is the sketch, it seems likely he copied the drawing from some other source than the birds themselves. The fine mottling and vermiculation of the plumages of the Chick-willows and the Night Hawk show not only great fidelity to nature but also most skilful handling of brush and colors. Perhaps the most artistic picture is that of a pair of Gnatcatchers, but those of the Goldfinches, the Redstarts and the Kinglets are nearly as good. His "Bay winged Bunting" and "Virginian Goatsucker" are here reproduced as two of the best examples of Abbot's art.

In conclusion, let me emphasize the conviction, that, not only in England, to which country Abbot returned and there ended his days at an advanced age, but also in the United States, there rest

concealed many manuscripts and other archives which would not only satisfy our curiosity about the man but would reveal historic and scientific data. His portrait, in colors, was published in Scudder's work on American insects, but in the same volume Scudder says that no specimen of his autograph name was available. The reproduction of an example of it with this paper and the information in the fine letter from which it is taken should be an encouragement to our English brethren to "start something" in this line of enquiry. Here are some queries: — Where was Abbot born and when? When did he return to England and when deceased? Was he married, and a parent? Did he own land in either country and keep house or board in lodgings? Where was he buried, and is there any notice of his death in local newspapers or in genealogies of Abbot families?

If the correspondence and manuscript collections of Sir James Edward Smith are preserved they will almost certainly yield some of these desiderata. This accomplished botanist, author and patron of science was founder and first president of the Linnæan Society of London. As Smith owned the unrivalled autograph collections of Linnæus and of many of his celebrated correspondents, it is probable these treasures yet exist in the archives and are accessible to students.

Let us hear from them by return mail.

List of John Abbot's Water Color plates of the "*Birds of Georgia*," now bound in one folio, one-half red morocco binding, belonging to the "Wymerley Jones De Renne Georgia Library," Wormsloe, near Savannah, Georgia.

Copied from the plates and identified February, 1918, by S. N. Rhoads, Haddonfield, N. J. (In the order of binding.)

1. "White eyed Flycatcher. *Muscicapa cantatrix*, length 5 Inches" = *Vireo griseus griseus*, ♂.
2. "Flax Bunting—length $4\frac{1}{2}$ inches." = *Astragalinus tristis tristis*. (♂ and ♀).
3. "Fowl Hawk" = *Accipiter velox*.
4. "Toupet Titmouse. *Parus Bicolor*: length $6\frac{1}{4}$ inches." = *Bæolophus bicolor*.

5. "Chuck wills widow. Length $12\frac{1}{2}$ inches." = *Antrostomus carolinensis*.

6. "Bay-winged Bunting. *Emberiza Graminea*. length $6\frac{1}{2}$ inches" = *Poæcetes gramineus gramineus*.

7. "Virginian Goatsucker. *Caprimulgus Virginianus*, length 8 inches." = *Chordeiles virginianus virginianus*.

8. "Great Carolina Wren. *Certhia Caroliniana*, length $5\frac{3}{4}$ inches." = *Thryothorus ludovicianus ludovicianus*.

9. "Great Meadow Lark. *Alauda Magna*, length $9\frac{1}{2}$ inches." = *Sturnella magna argutula*, ♂.

10. "Cat Flycatcher *Muscicapa Carolinensis*, length $8\frac{1}{2}$ inches" = *Dumetella carolinensis*.

11. "Pine-creeping Warbler. *Sylvia Pinus*, length $5\frac{1}{2}$ inches." = *Dendroica vigorsi*, ♂ and ♀.

12. "Chestnut-winged Oriole. Length $7\frac{1}{2}$ inches" = *Agelaius phæniceus phæniceus*, ♂.

13. "Barred tail Sandpiper, length $8\frac{1}{2}$ ins." = *Helodromas solitarius solitarius*.

14. "Loggerhead Shrike. *Lanius Carolinensis*, length $8\frac{1}{2}$ Inches." = *Lanius ludovicianus ludovicianus*.

15. "White-throated Finch. *Fringilla Pensilvanica*, length $6\frac{1}{2}$ Inches." = *Zonotrichia albicollis*, ♂.

16. "Brown Thrush. *Turdus fuscus*, length 7 Inches" = *Hylocichla ustulata swainsoni*?

17. "Indigo Bunting. *Emberiza cyanea*, length 5 Inches." = *Passerina cyanea*, ♂.

18. "Golden-legged Sandpiper. Length 12 Ins." = *Totanus melanoleucus*.

19. "Black Bunting. *Emberiza Hyemalis*. length $5\frac{1}{2}$ Inches." = *Junco hyemalis hyemalis*.

20. "Black and White Creeper. *Certhia maculata*, length $5\frac{1}{4}$ Inches." = *Mniotilta varia*, ♂.

21. "Towhe Bunting *Emberiza Erythrophthalma*. length $8\frac{1}{2}$ Inches." = *Pipilo erythrophthalmus erythrophthalmus*, ♂.

22. "Yellow breasted Warbler. *Sylvia Trichas*. length $5\frac{1}{2}$ inches." = *Geothlypis trichas ignota*, ♂.

23. "Black rumped Sandpiper. length 9 inches." = *Pisobia maculata*.

24. "Little Thrush. *Turdus Melodes*. length 7 Inches." = *Hylocichla fuscescens*.

25. "Mottled Oriole. length 10 Inches" = *Euphagus carolinus*, ♂ in winter.

26. "Hairy Woodpecker. *Picus villosus*. length $8\frac{1}{2}$ inches." = *Dryobates villosus auduboni*.

*27. "Sharp-tailed Hawk. *Falco caudacuta*. length 20 Inches. very rare." Not identifiable. Possibly a *Butco*.

28. "Yellow bellied Woodpecker. *Picus varius*. length 8 Inches." = *Sphyrapicus varius varius*, ♂ old adult in spring; with remarkable amount of white on upper parts.

29. "Red shouldered Hawk. Female." = *Butco lineatus alleni*.

30. "Cockaded Woodpecker. *Picus querulus*. length $8\frac{1}{2}$ inches." = *Dryobates borealis*, ♂.

31. "Black cap Hawk. female." = *Accipiter cooperi*.

32. "Brown Lark. Length $6\frac{1}{2}$ inches." = *Anthus rubescens*.

33. "American Teal. *Anas Carolinensis*. length 14 Ins." = *Nettion carolinense*, ♂.

34. "Least Nuthatch. *Sitta Pusilla*. length $4\frac{1}{4}$ Inches." = *Sitta pusilla*.

35. "Pewit Flycatcher. *Muscicapa Nunciola*. length 7 inches." = *Sayornis phæbe*.

36. "American Crossbill. *Curvirostra Americana*. length $5\frac{3}{4}$ Inches." = *Loxia curvirostra minor*. ♂ and ♀.

37. "Carolina Chatterer. *Ampelis Garrulus*. length 7 Inches." = *Bombycilla cedrorum*.

38. "Marsh Hawk. Length 20 inches." = *Accipiter cooperi*.

39. "Rice Bunting. *Emberiza Oryzivora*. length $6\frac{1}{4}$ Inches." = *Dolichonyx oryzivorus*, ♂, spring adult.

40. "Red winged Oriole. *Oriolus Phæniceus*. length $8\frac{1}{2}$ Inches." = *Agelaius phæniceus phæniceus*, adult ♂.

41. "Canada Titmouse. *Parus Atricapillus*. length $4\frac{1}{2}$ Inches." = *Penthestes carolinensis carolinensis*, ♂.

42. "Painted Bunting. Nonpareil. *Emberizis Ciris*. length $5\frac{1}{2}$ inches." = *Passerina ciris*, adult ♂ and ♀.

43. "Virginia Rail. *Rallus Virginianus*. length 13 Ins." = *Rallus elegans*.

44. "Hooded Warbler. *Sylvia Mitrata*. length $5\frac{1}{2}$ Inches." = *Wilsonia citrina*, ♂ and ♀.

45. "Ground Pigeon. *Columba passerina*. length 7 Inches." = *Chamepeelia passerina terrestris*.
46. "Yellow headed Warbler. Length $4\frac{1}{2}$ Inches. Very rare." = *Dendroica virens*, Juv. ♂, or ♀ in fall plumage?
47. "Red breasted Thrush. *Turdus Migratorius*. length 10 Inches." = *Planesticus migratorius migratorius*.
48. "Red Grosbeak. Female." = *Zamelodia ludoviciana*.
49. "Swamp Sparrow. *Fringilla Palustris*. length $5\frac{1}{2}$ Inches." = *Melospiza georgiana*.
50. "Mimic Thrush *Turdus Polyglottus*. length $9\frac{1}{2}$ Inches." = *Mimus polyglottos polyglottos*.
51. "Yellow poll Warbler. Length $5\frac{1}{4}$ inches. very rare." = *Dendroica pensylvanica*, spring adult ♂.
52. "Common Creeper. *Certhia Familiaris*. length $6\frac{1}{2}$ Inches." = *Certhia familiaris americana*.
53. "Golden crowned Wren. *Motacilla Regulus*. length 4 Inches." = *Regulus satrapa satrapa*.
54. "Fox coloured Sparrow. *Fringilla Rufa*. length 7 Inches." = *Passerella iliaca iliaca*.
55. "Ferruginous Thrush. *Turdus Rufus*. length 11 Inches" = *Toxostoma rufum*.
56. Passenger Pigeon. *Columba Migratoria*. length 16 Inches." = *Ectopistes migratorius*, ♂.
57. Carolina Pigeon. *Columba Carolinensis*. length $12\frac{1}{2}$ Inches." = *Zenaidura macroura carolinensis*, ♂.
58. "Purple Swallow. *Hirundo Purpurea* length $7\frac{3}{4}$ Inches." = *Progne subis subis*, ♂.
- *59. "Slate-coloured Hawk. *Falco Pennsylvanicus*. length $13\frac{1}{2}$ Inches. Female 16. [Inches]." = Apparently a hybrid between *Accipiter cooperi* and *Falco columbarius*! Not *Buteo platypterus*. May be *Accipiter velox*.
60. "Sparrow Hawk. female." *Falco sparverius sparverius*.
61. "Blue Warbler. *Sylvia Sialis*. length 7 Inches." *Sialia sialis sialis*, ♂.
62. "Blue eyed Warbler. *Sylvia Citrinella*. length $4\frac{3}{4}$ Inches." = *Dendroica aestiva aestiva*, ♂.
63. "Great Thrush. *Turdus Magnus*. length $7\frac{1}{2}$ Inches" = *Hylocichla mustelina*.

64. "Yellow rump Warbler. *Sylvia Coronata*. length 6 Inches."
= *Dendroica coronata*. Spring ♂ and ♀.
65. "Yellow throated Warbler. *Sylvia Flavicollis*. length $5\frac{1}{4}$ Inches."= *Dendroica dominica dominica*. ♂ Spring.
66. "Belted Kingfisher. *Alcedo Alcyon*. length $12\frac{1}{4}$ Ins."=
Ceryle alcyon alcyon; ♀ with fish.
67. "Black-throated Warbler. *Sylvia Canadensis*. length $5\frac{1}{4}$ Inches."= *Dendroica carulescens cairnsi*. Spring ♂, with black-spotted back.
68. "Black cap Hawk. *Falco Atricapillus*."= *Accipiter cooperi*. (See No. 31.)
69. "Black-headed Nuthatch. *Sitta Carolinensis*. length $5\frac{1}{4}$ Inches."= *Sitta carolinensis carolinensis*.
70. "Pigeon Hawk, or Louisiana Kite. *Falco Columbarius* length $14\frac{1}{2}$ Inches."= *Ictinia mississippiensis*.
71. "Black-billed Cuckoo. *Cuculus Erythrophthalma*. length $11\frac{1}{2}$ Inches."= *Coccyzus erythrophthalmus*.
72. "Noisy Plover. *Charadrius Voceferus*. length 10 Ins."= *Oxyechus vociferus*.
73. "Spotted breasted Sparrow. *Fringilla Melodia*. length 5 Inches."= *Melospiza melodia melodia*.
74. "Yellow Warbler. Length $5\frac{3}{4}$ Inches. rare."= *Vermivora pinus*; Spring ♂.
75. "Cardinal Grosbeak. *Loxia Cardinalis*. length 9 inches."= *Cardinalis cardinalis cardinalis* ♂.
76. Chicken Hawk. Length 17 Inches."= *Buteo lineatus alleni* in immature plumage.
77. "Carolina Cuckoo. *Cuculus Americanus*. length 12 Inches."= *Coccyzus americanus americanus*.
78. "Little Hawk. Length 10 inches."= *Buteo platypterus*.
79. "Water Thrush. *Turdus Aquaticus*. length 6 inches."= *Seiurus motacilla*.
80. "Boat-tailed Grackle. *Gracula Barita*. length 13 Inches."= *Quiscalus quiscula aglaeus*, ♂.
81. "Wood Pee wee Flycatcher. *Muscicapa Rapax*. length 6 Inches."= *Myiochanes virens*.
82. "Yellow red poll Warbler. *Sylvia Petechia*. length $5\frac{1}{2}$ Inches."= *Dendroica palmarum hypochrysea*, ♂ and ♀.

83. "Aculeated Swallow. *Hirundo Pelasgia*. length $5\frac{1}{4}$ Inches." = *Chætura pelagica*.
84. "Ruby crowned Wren. *Sylvia Calendula*. length $4\frac{1}{2}$ inches." = *Regulus calendula calendula*, ♂ and ♀.
85. "Golden crowned Thrush. *Turdus Aurocapillus*, length 6 Inches." = *Sciurus aurocapillus*.
86. "Sharp-tailed Finch. *Fringilla Caudacuta*. length $4\frac{3}{4}$ inches." = *Ammodramus lecontei*, ♂.
87. Tyrant Shrike. *Lanius Tyrannus*. length 8 Inches." = *Tyrannus tyrannus*.
88. "Georgia Wren. Length 5 Inches. very rare." = *Telmodytes palustris* (subsp.?).
89. "Red-shouldred Hawk. *Falco Lineatus*. length 19 Inches." = *Butco lineatus alleni*, ♂.
90. "Red Tanager. *Tanager Rubra*. length 7 inches." = *Piranga erythromelas*, ♂.
91. "Yellow breasted Flycatcher. Length $5\frac{1}{2}$ Inches." = *Lanivireo flavifrons*.
92. "Great Heron. *Ardea Herodias*. Length 4 feet." = *Ardea herodias herodias*.
93. "Summer Sparrow. Length 6 Inches." = *Peucæa æstivalis bachmani*.
94. "Prairie Warbler. *Sylvia Minuta*. length $4\frac{1}{4}$ Inches." = *Dendroica discolor*, ♂.
95. "Blue yellow backed Warbler. *Sylvia Pusilla*. length $4\frac{1}{4}$ Inches." = *Compsothlypis americana americana*; 2♂'s.
96. "Crested Flycatcher. *Muscicapa Crinita*. length $9\frac{1}{2}$ Inches." = *Myiarchus crinitus*.
97. "Yellow winged Sparrow. *Fringilla Passerina*. length 5 Inches." = *Ammodramus savannarum australis*.
98. "Brown Gallinule. Length 12 Inches." = *Gallinula galeata*.
99. "Mottled Oriole. Female." = *Euphagus carolinus*, ♀.
100. "Marsh Wren. *Certhia Palustris*. length 4 Inches." = *Cistothorus stellaris*.
101. "Spotted Heron. Length $23\frac{1}{2}$ Inches" = *Nycticorax nycticorax nævius*. Juv.
102. "Black-crowned Warbler. Length $5\frac{1}{4}$ Inches." = *Dendroica striata*, ♂.

103. "Black headed Flycatcher. *Muscicapa Ruticilla*. length $5\frac{1}{2}$ Inches." = *Setophaga ruticilla*. ♂ and ♀, ad.

104. "Red eyed Flycatcher. *Muscicapa Olivacea*, length 6 Inches." = *Vireosylva olivacea*.

105. "Orchard Oriole. *Oriolus Castanus*. length $6\frac{1}{2}$ Inches" = *Icterus spurius*, ad. ♂.

106. "Blue Grosbeak. *Loxia Cærulea*. length $6\frac{1}{2}$ Inches" = *Guiraca cærulea cærulea*. ad. ♂.

107. "Little Sparrow. Length $5\frac{1}{2}$ Inches." = *Spizella passerina passerina*, ♂ and ♀, ad.

108. "White billed Woodpecker. *Picus Principalis*. length 20 Inches." = *Campephilus principalis*; ad. ♂.

109. "Red headed Woodpecker. *Picus Erythrocephalus*. length $9\frac{1}{4}$ Inches." = *Melanerpes erythrocephalus*.

110. "Mississippi Kite. *Falco Misisippiensis*. length 2 feet." = *Elanoides forficatus*.

111. "Little Woodpecker. *Picus Pubescens*. length $6\frac{1}{4}$ Inches." = *Dryobates pubescens pubescens*, ♂.

112. "Worm eating Warbler. *Sylvia Vermivora*. length $5\frac{1}{4}$ Is." = *Helminthos vermivorus*.

113. "Black Oriole. *Oriolus Niger*. length 10 Inches." = *Euphagus carolinus*, Spring ♂.

114. Solitary Flycatcher. *Muscicapa Solitaria*. "length $5\frac{1}{2}$ Inches." = *Lanivirco solitarius* (subsp.?).

115. "Screech Owl. Length $8\frac{1}{2}$ Inches." = *Otus asio* (subsp.?). Gray phase.

116. "Brown Ibis. *Tantalus Fuscus*. length 2 feet." = *Guara alba*, juv. ♀.

117. "Small blue gray Flycatcher. *Muscicapa Cærulea*. length $4\frac{1}{2}$ Inches." = *Poliophtila cærulea cærulea*. Ad. ♂ and ♀.

118. "Wood Ibis. *Tantalus Loculator*. length 3 feet." = *Mycteria americana*.

119. "Gold winged Woodpecker. *Picus Auratus*. length 12 Inches." = *Colaptes auratus auratus*; ad. ♂.

120. "Carolina Woodpecker. *Picus Carolinus*. length $12\frac{1}{2}$ Inches." = *Centurus carolinus*; ad. ♂.

121. "Prothonotary Warbler. *Sylvia Protonotarius*. length $5\frac{1}{2}$ Inches." = *Protonotaria citrea*; Ad. ♂ and ♀.

122. "Magnolia Warbler." = *Dendroica tigrina*, Ad. ♂.

List of Insects represented in Abbot's Portfolio of Georgia Birds.

- Plate 6. "*Sphinx lineata*."
 " 20. "Small blue Butterfly" = *Lycæna*.
 " 25. "*Noctua guaræ*."
 " 32. "Great Tiger Moth" = *Arctia*.
 " 45. "Clouded yellow Butterfly" = *Cohas*.
 " 61. "Great meadow brown Butterfly" = *Satyrus*.
 " 62. "Purple hair streak Butterfly" = *Thecla*.
 " 65. "None so pretty Moth" = *Deiopeia*.
 " 67. "Cream spotted Tyger Moth." = *Callomorpha*.
 " 85. "*Papilio arythia*" = *Junonia*.
 " 87. (Grasshopper on ground; not named) = *Chortophaga*.
 " 88. "Ajax Butterfly." = *Papilio*.
 " 91. "Yellow spotted Tyger Moth" = *Alypia*.
 " 106. "Small yellow Butterfly" = *Terias*.
 " 111. "Yellow hook tip Moth" (Bombycid?).
 " 122. (Butterfly — name cut off) = *Agraulis*.

NOTES ON THE ANATOMY OF THE CUBAN TROGON.

BY HUBERT LYMAN CLARK.

THANKS to the kindness of Mr. Outram Bangs and Mr. J. L. Peters, a Cuban Trogon (*Priotelus temnurus temnurus*) collected by Mr. Peters, was some time ago placed in my hands for study. It was well preserved in alcohol and in excellent condition.

The pterylosis of the trogons was described by Nitzsch, who examined four species, but probably from skins. Subsequent writers seem to have relied on Nitzsch's figures. The spinal feather tract is quite passerine and those of the ventral surface are nearly as much so. The Cuban Trogon was not however seen by Nitzsch and shows some peculiarities which are worthy of descrip-

tion. These are however, mostly confined to the head and neck for the humeral, femoral, sternal, ventral and dorsal tracts are very similar to those of *Trogon viridis* as shown by Nitzsch's description and figures; the dorsal "saddle" however, is elongated elliptical rather than "elongated rhombic," as there are no distinct lateral angles.

The tracts of the head are entirely separated from those of the lower neck and throat, to a degree and in a manner which I have never seen in any other bird. On the middle of the forehead, between the eyes, is a dense, sharply defined tract, which forks anteriorly, a broad band passing forward and downward to the base of the upper mandible on each side; posteriorly the median tract becomes diffuse and loses itself on the back of the head. There are no contour feathers on the upper surface or on either side of the anterior end of the neck. On the lower surface of the head, beginning close to the base of the bill in the median line is a sharply defined tract about *five* feathers wide which very soon divides, the two branches diverging and narrowing rapidly; each passes up onto the side of the head, where it ends below the ear. The only other contour feathers on the head are in a small tract on each side, just in front of the eye; some few of these feathers extend up over the eye but more comprise a narrow band running from the angle of the mouth to the ear; anteriorly this tract does not quite connect with the lateral fork of the forehead tract.

On the upper side of the base of the neck, the spinal tract begins abruptly with a width of about five feathers; from its very start this tract is dense and well defined. On the lower surface of the neck, a lower cervical tract begins nearly as far forward as the ear; it is six or seven feathers wide and sharply defined from the first. It soon widens and forks, each fork giving rise to a sternal tract. From the anterior end of each sternal tract a branch passes upward onto the shoulder and joins the humeral tract. The outer distal corner of the humeral tract extends outward along the humerus to the elbow, the feathers of this area reminding one of tertiaries. The secondaries are eleven or twelve in number but one or two of those at the elbow are very small and in examination of a skin, there would seem to be but ten; Nitzsch says there are eight to ten secondaries in the trogons. The primaries are ten in number with

the sixth longest; the sequence is 6, 7, 5, 8, 4, 9, 3, 2, 1, 10; the eighth is 97 mm. long, the fourth is 90 mm. and the tenth, 45 mm.

The rectrices are twelve with ten major coverts; there is no covert for rectrix no. 1 (middle pair); the covert for no. 2 lies over its outer side; those for nos. 3, 4 and 5 are in the same relative position while that for no. 6 lies over its inner side. This is the usual passerine arrangement. The posterior end of the spinal tract becomes broad (ten feathers) and dense at the oil-gland where it ends, instead of being narrow there as shown in Nitzsch's figures; it is distinctly separated from the series of major upper tail coverts. The oil-gland itself is naked, without a tuft. The major under tail coverts are 14 in number but on each side pass into a well marked post-anal tract of covert feathers; the major coverts of the middle rectrices are pushed out of position, so that coverts 1 and 2 lie, one over the other under rectrix 2, covert 3 is between rectrices 3 and 4, covert 5 is under rectrix 4, 6 is under 5 and 7 under 6. It is not clear whether covert 7 is properly a major covert or is merely a large minor covert pushed into the major covert line. The whole question of the relation of under coverts to rectrices demands investigation.

Passing to the internal anatomy, we find the palate is essentially as Forbes found it in *Pharomacrus*,¹ but the vomer is shorter and stouter than in that trogon and does not extend forward between the maxillopalatines. The sternum, as in other trogons, has two deep incisions on each side, in the posterior margin, and the manubrium though long and stout is not at all forked. Four pairs of ribs reach the sternum but the fifth pair falls short by over a millimeter, its tip resting only against the base of the fourth.

The tongue is not "short and three-sided," as trogon's tongues are said to be, but is 10 mm. long and has a bifurcate tip, each half of which is a pointed horny bit, one millimeter long. Posteriorly the tongue is 4 mm. wide with each posterior corner developed into a conspicuous conical horny point over a millimeter long. There is no crop and the gizzard is large and spherical, 18 mm. in diameter. It was crammed full of fruits 7-8 mm. long by 4-5 mm. thick; there were 10-12 of these fruits, some of which were considerably

¹ Proc. Zool. Soc. London, 1881, p. 836.

macerated, however. The intestine was 180 mm. long while the cæca were 36 and 28 mm. respectively. The cæca are thus relatively very long, much longer than in the species of Trogon and Pharomacrus examined by Garrod.

FURTHER NOTES AND OBSERVATIONS ON THE
BIRDS OF HATLEY, STANSTEAD COUNTY,
QUEBEC, 1916-1917.

BY H. MOUSLEY.

IN 'The Auk' for 1916, Vol. XXXIII, pp. 57-73, 168-186; will be found my first account of the birds of this district covering a period of five years (1911-1915) and embracing 122 different species. Since that account was written a further 41 have been added to the list, and in this paper I propose to deal with these new species in the same way as previously, carrying on the numbering also from where it left off. Before proceeding with these however, I would like to make a few remarks on the seasons of 1916 and 1917, and the increase or otherwise of certain interesting birds, as well as to mention the fact that the breeding list has been increased from 63 to 77 species, the fourteen new ones whose nests, eggs or young had not been previously taken being, Marsh Hawk, Red-shouldered Hawk, Sparrow Hawk, Long-eared Owl, Belted Kingfisher, Red-headed Woodpecker, Meadowlark, Pine Siskin, Scarlet Tanager, Nashville, Black-throated Blue, Blackburnian, and Black-throated Green Warblers, as well as the Water-Thrush. Of the two aforementioned seasons probably 1917 was the coldest, wettest and most backward of the two, and many species, especially the warblers, were held up on migration, and were from ten days to a fortnight behind time. Ruffed Grouse suffered severely, most of the chicks being lost in both seasons from exposure to the wet and cold, and these birds in my opinion badly need a three years close season, not only here but in many other parts of the country, to recuperate.

In contrast to the lateness of the warblers in arriving many of the earlier species were well on time, and I obtained my earliest records so far for several species, the most notable being amongst the Blackbirds and Sparrows, the latter family also being especially numerous, in fact, 1917 might be called a White-crowned Sparrow year judging from my own experience, and that of some of my friends, of the increase in the numbers of this otherwise somewhat rare migrant. Looking back over the past seven years, I have no hesitation in saying that the following birds are gradually increasing and spreading over this district, viz., Bronzed Grackle, Cedar Waxwing, Prairie Horned Lark, Meadowlark, Migrant Shrike, Purple Finch, and Chestnut-sided Warbler, and I hope like other parts of the Province of Quebec (where it is said to be much on the increase of late) we may yet get the Killdeer Plover, for I saw three of these birds during March and April of the present year 1917, the only other previous record being one on July 31, 1915.

Bronzed Grackles first invaded the village of Hatley in 1916, and nested in some of the firs and pines. Cedar Waxwings were unusually abundant in 1916, and I had no difficulty in locating about a dozen nests, as against a total of only one or two for each of the previous four years. On September 18, 1916, I saw the largest flock of this species noted so far, which consisted of fifty birds. Migrant Shrikes are certainly most interesting birds, and I have found more nests during the past two years than all the previous five put together. The favorite site here is certainly an apple tree, for out of ten nests located, seven have been in these trees at an average height of ten feet, whilst the remaining three have been in firs, one at the record height of thirty-four feet above the ground, (see Auk, Vol. XXXV, 1918, pp. 33-36), the other two being ten and eighteen feet. Purple Finches were a feature of 1916, and I saw birds in my garden all through the months of April to October. Prairie Horned Larks were first seen in 1917 on March 2, my earliest date so far, but only one nest was located in the two years with the characteristic paving as described in 'The Auk,' Vol. XXXIII, 1916, pp. 281-286, and Vol. XXXIV, 1917, p. 388.

As an offset to the above increase may be mentioned the 'status quo,' if not actual decrease in the case of the two latter, of such interesting species as the Indigo Bunting, Rose-breasted Grosbeak,

Catbird and Black-billed Cuckoo, and in this category not unfortunately but most fortunately may be included the Cowbird, as the only other victim besides the Red-eyed Vireo and Yellow Warbler mentioned in my previous notes, is that of a Junco who was seen feeding a young Cowbird just able to fly on June 24, 1916. Of the Indigo Bunting only one pair was seen on the roadside half way between Hatley and Coaticook on June 4 of the present year 1917, and of the Rose-breasted Grosbeak none were observed in 1916, and only one male and female in May, 1917. As regards the Catbird and Black-billed Cuckoo they were never by any means plentiful, but during the past two years their numbers seem to have dwindled to almost the vanishing point. Of the former only one nest has been located in the past two years and very few birds observed at any time, whilst of the latter, none were seen in 1916, and only one in 1917 on May 28, and no nests were found in either year. The number of Downy and Hairy Woodpeckers is not at all satisfactory, and it is becoming quite an event to see one of the latter, and ever since 1912 (when they were so abundant) Vireos have been falling off in numbers, so much so that I have not found a single nest of the Warbling since, and only a very few of the Red-eyed, which latter in 1912 were found all over the place, sometimes three and four a day. Swamp Sparrows apparently since 1913 have also been getting less and I rarely come across more than one or two nests a season now. Concerning my favorites, the Sandpipers and Warblers, I regret to say that owing to the temporary raising of the outlet of the dam at the head of 'the marsh,' in 1916, I saw very few of the Limicolæ, as the increased depth of the water submerged most of the mud banks, and only such species as the Greater Yellow-legs were able to use them, a party of seven (the largest so far) being seen on August 29. Two examples of Wilson's Snipe were noted on May 4, of the same year, thus giving me my first spring record for this species. Early in May, 1917, I changed my residence temporarily for one some three miles further north and remained there until the end of the year, only visiting 'the marsh' on a few occasions. On one of these however (September 24), I was fortunate enough to add two new species to my list, securing an example of the American Pipit and Little Green Heron, the latter being an especial good find for these parts. But

what I missed in the Sandpipers by my change of residence, I more than made up for in the Warblers, as my new hunting grounds furnished me with two examples of the Tennessee, as well as a nest and set of eggs of the Nashville and Blackburnian, the first two birds being new to my list. An account of these will be found in the annotated notes. As regards the nest of the Blackburnian Warbler (the only one of the thirteen summer visitants remaining so far unfound, see 'The Auk,' Vol. XXXIV, 1917, p. 190). I was fortunate enough on June 8, to notice the female with building material in her beak, fly direct to the site, which was a fir tree on the outskirts of a small wood. At this date building operations had only just commenced, and it was not until June 19, that the nest held the full complement (usually four, sometimes five) of four eggs, which, by the way, were the most brittle I have ever handled, one collapsing as it was being lifted out of the nest, whilst two of the remaining three could not be drilled with a true round hole, the drill sinking into the shell immediately a little pressure was applied, and thus causing a somewhat jagged edge. The ground color is quite distinctive being of a bluish tint with somewhat bold blotches of rufous brown round the larger end, the average size of the set being $.70 \times .49$.

The nest (which was presented in situ to the Victoria Memorial Museum at Ottawa) was thirteen feet above the ground and placed on a horizontal branch thirteen inches out from the trunk, and twenty-one from the tip of the branch, and was composed outwardly of small fir twigs woven together and held by spider's silk, the lining consisting of fine dry grasses, some usnea lichen, and a few fine rootlets, the dimensions being, outside diameter $3\frac{1}{4}$, inside $1\frac{3}{4}$ inches. Outside depth 2, inside $1\frac{1}{2}$ inches. As regards the male I do not think he does any building at all, as I never once saw him at the nest, nor did he appear to accompany the female as was the case with the Nashville, but I could generally hear him some little distance off singing in the tree tops.

Besides this I saw many Cape May Warblers in full breeding plumage, a little tamarack tree on one occasion holding no less than five males and one female, and later on in October, I obtained my first fall record for the Yellow Palm Warbler and Woodcock. Of the former I had only seen a very few examples in the spring, and

of the latter only one other bird, which with the present one makes two in seven years, so that the sport of woodcock shooting round Hatley cannot be said to be fast and furious. The Blackpoll Warbler was also a new and interesting addition to my list, but this was found at Ayers Cliff, some few miles away, and is dealt with fully elsewhere.

Other interesting items include a nest and set of eggs of the Marsh Hawk and Meadowlark besides the taking of a small series of Dr. Townsend's new subspecies, the Labrador Chickadee (*Penthestes hudsonicus nigricans*), in May and early September, some of which were given to Dr. Townsend and the rest to the Victoria Memorial Museum at Ottawa, these examples being the first Canadian ones to be presented to that institution.

Whilst working over this new ground (which in general was of a more swampy nature than the other) I also had the pleasure of finding the pitcher plant in bloom, as well as six new orchids, of which Hatley now possesses thirteen species to my knowledge.

The nest of the Red-headed Woodpecker was likewise in this locality, but is dealt with in the following annotated list, in which the name of Mr. W. E. Greer also appears not only in connection with this bird, but with several others as well. Mr. Greer, besides being Secretary-Treasurer of the Township of Hatley, farms about 150 acres of land at Hatley Centre, and is a taxidermist of some ability as well, and at one time possessed a fine collection of about one hundred birds of his own mounting, representing nearly eighty local species. This collection was unfortunately destroyed in a disastrous fire in 1909 that burnt Mr. Greer out of house and home, besides destroying all his records. The house was rebuilt and the collection is also in the slow process of being reformed. In his connection as a taxidermist many rare birds were brought to him to be mounted, which had either been shot in the district, or caught in traps set for muskrats or other small mammals. He thus gained a more intimate knowledge of the ducks, hawks and owls of the district than I have been able to do, and I am much indebted to him for valuable help with regard to these species, as will be seen in the list that now follows, of the forty-one new species added since 1915.

123. *Podilymbus podiceps* (Linnæus). **PIED-BILLED GREBE.**—Not uncommon fall migrant. So far I have not come across any of these birds, but Mr. Greer tells me he has seen them occasionally but has never mounted any. Mr. Stephen Clarke of Hatley Centre however, informs me that he has shot a few on Lake Massawippi, usually in the month of September, and on one occasion when fishing in the company of Mr. Fleming of New York, he obtained three at one shot. On this gentleman relating the incident to some of his friends the story was put down as "another of those fishing yarns" from the fact that these birds in company with Loons are generally looked upon (to a large extent erroneously) as being almost unshootable, from their habit of rapidly diving at the flash or report of a gun, hence the local names of devil diver or hell diver which this species enjoys.

124. *Gavia immer* (Brünnich). **LOON.**—Fairly common fall transient. My authority for including this species in my list rested at first on two mounted examples belonging to Mr. A. Murray of Ferncliff, Massawippi, one of which was shot on Lake Massawippi about twenty years ago, whilst the other was taken about the same time entangled in some fishing tackle. Mr. Greer however, informs me that he generally gets a few to mount most years, but never in the spring, only fall birds, and these, with only one exception, immatures.

125. *Uria lomvia lomvia* (Linnæus). **BRÜNNICH'S MURRE.**—Rare transient. Probably this bird is more of an accidental transient than anything else, being blown inland by easterly gales, one of which had been raging just previous to two examples being obtained on the river Massawippi, just below the village of North Hatley, on December 10, 1917. One of these two was shot by Mr. J. Robert of North Hatley and weighed 1 lb., 2 oz., the other by Mr. Alec McKay of Hatley Centre, which bird weighed 2 lbs. 1 oz. Both were in the hands of Mr. Greer (when I saw them on December 12) and were still in the flesh, waiting to be skinned and mounted for their respective captors. The great difference in the above weights would no doubt be accounted for, by one being practically an adult, the other an immature. Mr. J. E. Harting in his 'Handbook of British Birds' 1901, p. 470, gives the weight of *lomvia* as 2 lbs., 10 oz., and that of *troile* as 2 lbs. 5 oz., whilst Mr. Thos. H. Nelson in his 'The Birds of Yorkshire,' 1907, p. 721, gives the average weight of the latter as 2 lbs.

126. *Rissa tridactyla tridactyla* (Linnæus). **KITTIWAKE.**—Rare and accidental transient. My authority for including this species in my list rests on a single immature example which Mr. Greer mounted for Mr. Clarence W. Clarke of Nepperhan Heights, Yonkers, N. Y., who on August 17, 1912, whilst staying at North Hatley, captured the bird on Lake Massawippi under somewhat peculiar circumstances, as will be seen from the following extract of a letter dated October 30, 1917, which Mr. Clarke wrote me on the subject. He says, "I was angling for bass, using live minnows for bait, without any sinker, the minnows swimming near the surface, when I noticed a lone bird circling around the boat. I had about

seventy-five feet of line out, when it suddenly made a dive and flew off with the minnow carrying the entire line out of the water. This operation was repeated with two other minnows. I finally changed my bass hook for a small minnow or bait hook, and on the fourth try I hooked the bird and reeled it into the boat where it fought and struggled hard to get away, but it was well hooked. I put it in my bait can and took it alive to the taxidermist, and it now occupies a place over my mantelpiece at Yonkers. It was a very interesting and unusual catch, and few of my friends would believe that I captured the bird on a fish hook, setting it down for simply another one of those fish stories."

127. **Larus argentatus** (Pontoppidan). HERRING GULL.—Not uncommon fall transient. Mr. Greer tells me this gull is fairly common in the fall on Lake Massawippi, and he has mounted several examples for various people. Mr. W. Bassett of North Hatley has one which he tells me he shot at North Hatley in November, 1911 or 1912.

128. **Mergus americanus** (Cassin). AMERICAN MERGANSER.—Not uncommon transient. October 11, December 6. On the above date in October, 1916, a head and neck only of a female merganser was given to me, the bird having been shot on the same day on the river Coaticook near Compton about seven miles from Hatley. On measuring the distance from the nostril to the end of the bill I found it to be 1.30 inches, and from the rear of the nostril to the lore feathers .55 of an inch, thus proving it to be one of the above species and not a Red-breasted Merganser. Mr. Greer has a mounted head and neck of a male in his collection which was shot on Lake Massawippi, and on December 6, 1917, I saw a small flock of seven on this same lake, one of which, a female, was shot a few days after, and shown to me by Mr. Greer in the flesh on December 12. This bird weighed 3 lbs. Mr. Stephen Clarke of Hatley Centre has a female mounted example of this species, or at least one of his sons has it now, and which I saw on December 13, 1917.

129. **Mergus serrator** (Linnaeus). RED-BREASTED MERGANSER.—Not common transient. December 6. This Merganser is decidedly rarer than the preceding one, Mr. Greer telling me that previous to this year, he can only call to mind having mounted two examples. On the above date in December, 1917, I saw three examples on Lake Massawippi at North Hatley, one of which, a female, was shot on the following day by Mr. V. Thomas of North Hatley, on the Massawippi River just below North Hatley, and this bird Mr. Greer showed me on December 12, just after he had mounted it. I took the measurement from the nostril to the end of the bill and found it to be practically $1\frac{3}{4}$ inches.

130. **Lophodytes cucullatus** (Linnaeus). HOODED MERGANSER.—Rare transient. My authority for including this species in my list rests on a female example which Mr. Greer tells me he mounted some years ago, the exact records of which are unfortunately not to hand, but as far as he can remember, the bird was either shot or caught in a muskrat trap at Little Magog Lake.

131. *Querquedula discors* (Linnaeus). BLUE-WINGED TEAL.—Rare transient. The only examples I have heard of so far are one that Mr. Greer tells me he mounted in April 1910, the bird being a female, and a few that Mr. Stephen Clarke of Hatley Centre informs me he has shot from time to time but has never had mounted.

132. *Aix sponsa* (Linnaeus). WOOD DUCK.—Rare transient. I have not come across this handsomest of ducks so far in life, but Mr. Greer tells me he has mounted three male examples, one for Mr. S. J. Clarke of Hatley Centre, which was caught in a muskrat trap on Little Magog Lake in the middle of April about eight years ago, another for Mr. D. C. Bell of North Hatley, which was shot also on Little Magog Lake on April 26, 1910, and the third for Mr. S. A. Ball also of North Hatley which was shot on the Magog River somewhere about the year 1908. The first two examples were shown to me on December 6, 1917, and at that time were still in the possession of their respective captors. It is probably only a matter of time before this beautiful duck will have to be numbered amongst the extinct species.

133. *Clangula clangula americana* (Bonaparte). AMERICAN GOLDEN-EYE.—Rare transient. My authority for including this species in my list rests on an example which Mr. Greer tells me he mounted for Mr. R. G. Spriggins of North Hatley on December 5, 1909. The bird which is an adult male was shot by Mr. Spriggins along the eastern shore of Lake Massawippi, and when I saw it on December 6, 1917, was still in the possession of the captor.

134. *Oidemia americana* (Swainson). AMERICAN SCOTER.—Rare transient. My authority for including this species in my list rests on an adult male, which Mr. W. Bassett of North Hatley tells me he found dead on the ice on Lake Massawippi about December 6, 1915. Mr. Bassett had noticed the bird about for several days previously, on an open drain near the shore of the lake and had made up his mind to secure it, but on arrival at the spot about the above date he noticed the bird some distance out on the ice of the lake. For the purpose of heading it inland he made a detour on the ice, but on gradually drawing closer and closer he was surprised to find it did not move, and on eventually reaching the bird it was found to be dead. He kept it for several days and eventually sent it to Mr. Greer on December 13 who informs me that it was too far gone to preserve, but he confirms the record as being an adult male of the above species.

135. *Butorides virescens virescens* (Linnaeus). LITTLE GREEN HERON.—Rare transient; September 24. The above date in 1917 is the only one on which I have come across this handsome little heron, which in company with another was feeding in the center of "the marsh." Both birds got up when I was a long way off and not being familiar with the species at the time, I was unable to make out what they were. One made for some adjacent woods whilst the other directed its course to a neighboring small marsh and sheet of water, which my son and I call the "Smiling Pool." I followed the latter backwards and forwards from this pool

to "the marsh" for two and one half hours, before I was able to secure it at last at the former place. The bird was sent in the flesh and presented to the Victoria Memorial Museum at Ottawa.

136. *Nycticorax nycticorax nævius* (Bodd.). BLACK-CROWNED NIGHT HERON.—Rare transient. I am indebted to Mr. Stephen Clarke of Hatley Centre for first being able to include the above species in my list. The record rests on a mounted example in the possession of Mr. Clarke, which he shot on or about April 15, 1908, at Fitch Bay some twelve miles from Hatley, and when shown to me on November 5, 1917, proved to be an adult bird. When obtained it had three occipital plumes but one of these has since been accidentally pulled out. Mr. Greer also tells me he set up one of these birds for the late Mr. Hollis J. Hitchcock of Massawippi about 1907 or 1908, which was caught in a muskrat trap at Lake Massawippi.

Since writing the above I have had an opportunity of more carefully examining Mr. Clarke's bird, and find that the three occipital plumes are still there, one plume having at some time so perfectly overlapped one of the others, as to give the bird the appearance of only having two, and thus causing Mr. Clarke to think that one had been abstracted.

137. *Cathartes aura septentrionalis* (Wied). TURKEY VULTURE.—Rare transient from the South. July 31. On the above date in 1917 whilst driving from Hatley to Massawippi, a bird of this species flew off the road and alighted on the fence alongside. My youngest son who was with me at the time, was the first to notice it, exclaiming "why there is a white headed crow or something!" I looked up just in time to catch sight of the bird as it left the fence and alighted on the ground not far from the road, and at the edge of a large wood. I got down and followed the bird about the wood for some time, flushing it out on one occasion quite close to my son who was standing in the road holding the horse, when he got a good view of it, telling me afterwards that it looked like a young turkey. The bird was evidently an immature as it only took short flights about the wood, and I got several good views of it, as it sat perched in the trees, the grayish down on its bare head, no doubt causing the allusion at the moment to the "white-headed crow or something!" of my son. I visited the spot again the following day but nothing more was seen of it.

138. *Falco sparverius sparverius* (Linnaeus). SPARROW HAWK.—Rare summer visitant. June 15, 30; July 8. The earliest of the above dates in June, 1916, was the first occasion on which I had observed this handsome little hawk. The bird was quite close to me so that identification was an easy matter. On the latter date in June I saw another, and one again on July 8. Of course it is possible that these three examples may have been one and the same bird, the dates certainly suggesting that on occasions it may be a rare breeder in the neighborhood, in seeming confirmation of which Mr. Greer tells me that he saw an adult bird with young near Waterville in the summer of 1917.

139. *Asio wilsonianus* (Lesson). LONG-EARED OWL.—Rare resident.

Mr. Greer tells me that a pair of these owls have nested in his cedar swamp at Hatley Centre for at least four years if not longer, and that three or four examples have passed through his hands to mount during the past eight years, besides one which he has in his own collection.

140. **Asio flammeus** (Pontoppidan). SHORT-EARED OWL.—Rare transient. Mr. Greer tells me that he has only had one of these owls brought to him to mount by Mr. Oral Bean of North Hatley. Mr. Greer found one himself lying dead on the roadside not far from his house at Hatley Centre, which had probably been killed by flying against the telephone wires.

141. **Scotiaptex nebulosa nebulosa** (J. R. Forster). GREAT GREY OWL.—Rare winter visitant. Mr. Greer tells me he has only mounted two examples of this large and rare owl, one for Mr. H. R. Worthen of Ayers Cliff, which bird was obtained about January 19, 1911, near Ayers Cliff, and the other for Mrs. Elmer Colt of North Hatley, this bird being shot in her sugar woods by Mr. Brissette, so she tells me, some time in March about twelve years ago, and when I saw it on December 21, 1917, it was still in her possession.

142. **Cryptoglaux funerea richardsoni** (Bonaparte). RICHARDSON'S OWL.—Rare transient. Mr. Greer tells me he has only mounted one example of this rare winter visitant from the north, the exact records of which were unfortunately destroyed in the fire of 1909.

143. **Cryptoglaux acadica acadica** (Gmelin). SAW-WHET OWL.—Not uncommon resident. I have never seen this, the smallest of our owls, in life, but on April 4, 1916, I heard sounds proceeding from a wood near my house, which might well be likened to the filing of a saw, and no doubt proceeded from one of these small owls whose nest was probably in the locality, as the sounds were heard shortly before and after the above date by one or two other people. However, on October 20, 1917, an example was given to me in the flesh which had been shot the same day in a cedar swamp about a mile north of Hatley village, and which is being mounted by Mr. Greer, who tells me that he generally gets a few every year, only later in the fall, three examples being sent in last year, and from conversations I have had with many other farmers in the district it appears this little owl is fairly well distributed.

144. **Otus asio asio** (Linnæus). SCREECH OWL.—Rare transient. When visiting Mr. A. Murray of Ferncliff, Massawippi, on July 27, 1917, a nicely mounted example of this little owl (in the gray phase of plumage) was shown to me, which had been shot about two years ago on Mr. Murray's estate. I have never seen the bird myself in life nor can I remember ever having heard it calling, and Mr. Greer tells me no examples have so far been brought to him to mount.

145. **Bubo virginianus virginianus** (Gmelin). GREAT HORNED OWL.—Rare resident. My only acquaintance with this large owl was on October 11, 1916, when an example was shown to me in the flesh, the bird having been shot in the neighborhood of Hatley. This example turned the scales at 3 lbs. 14 oz., which will help to give some idea of its size, as

compared with the little Saw-whet Owl which only weighs some few ounces. Mr. Greer informs me that he mounted two examples of this owl in the winter of 1916-17, and has seen the bird in the summer months, so that I think I am justified in calling it a resident species.

146. *Nyctea nyctea* (Linnæus). SNOWY OWL.—Rare and irregular winter visitant. In the winter of 1905-06 there was an unusual flight of these owls all over Maine and the adjacent states as recorded by the late Mr. Ora W. Knight in his 'Birds of Maine' 1908, p. 263, wherein he states that fully two hundred were killed in Maine alone. In this same year they visited Hatley, and several were obtained, one by Mr. A. E. Gage of Hatley, which bird was mounted and is now in the possession of Mr. H. F. Pope also of Hatley. It is a fine specimen and quite regularly barred. Mr. Murray of Ferncliffe, Massawippi, also showed me a mounted example, which, if I remember rightly, he said was shot in his own grounds, at all events if not, it was in the immediate neighborhood.

Mr. Greer informs me as well that he has mounted quite a number of these owls, eight or nine one winter (probably the one mentioned above), one of which was almost pure white, with only the faintest trace of dusky spots or barring.

147. *Surnia ulula caparoch* (Müller). HAWK OWL.—Rare winter visitant. Mr. Greer tells me that he had one of these owls in his collection (previous to the fire) which was shot by his brother along the eastern shore of Lake Massawippi. He has also mounted two or three other examples, one for Mr. W. Bassett of North Hatley in February, 1913, which bird was also obtained along the eastern shore of Lake Massawippi, and when I saw it on December 6, 1917, was still in the possession of the captor.

148. *Picoides arcticus* (Swainson). ARCTIC THREE-TOED WOODPECKER.—Rare fall and winter visitant. I have to thank Dr. C. L. Brown of Ayers Cliff for drawing my attention to the fact that he had seen a mounted example of a Three-toed Woodpecker (but was unable to say which kind) that had been shot in the grounds of Ferncliff, the residence of Mr. A. Murray of Massawippi. I called upon that gentleman on July 27, 1917, and was shown the bird, which turned out to be a male example of the above species, and was shot in the fall of 1915 quite close to Mr. Murray's house.

Mr. Greer of Hatley Centre also informs me that he had a male in his collection (before it was destroyed) which was shot on his own farm by his brother some years previous to the fire in 1909.

149. *Melanerpes erythrocephalus* (Linnæus). RED-HEADED WOODPECKER.—Very rare summer visitant. May 15 to August 15; eggs, June, young, July. When on July 14, 1917, I received a letter from Dr. C. L. Brown of Ayers Cliff saying that he had noticed a Red-headed Woodpecker on several occasions at a certain spot, and thought there might be a nest, as he had that day seen the bird's mate also, I marked the day as a red letter one, although I must admit I felt somewhat sceptical, as Red-headed Woodpeckers in these parts are certainly a

desideratum. However, July 16 found me at the spot indicated which was on the roadside between Massawippi and Hatley Centre, on the farm belonging to Mr. Geo. Raeburn, who informed me that he first noticed the birds about the middle of May, and that they had a nest and four young on the roadside not far off, so I went to investigate and sure enough it was not long before I caught sight of both parent birds making for a decayed maple tree close to the roadside, where the nest was found about fifteen feet above the ground. Not wishing to disturb the birds I did not climb to it then, nor have I done so since, and can therefore give no dimensions of nesting hole at present, as I am anxious to see whether the birds will return next year and occupy the old site again. I might however, casually mention that the entrance hole was not a perfect circle, being more of a heart shape from some cause or another. Five days later, or on July 21, I again visited the spot and took some photos of the nest site, with both parent birds near the hole. At first they were somewhat nervous on seeing me and kept up a great chatter before one of them ventured to the hole and fed the young. Afterwards they became accustomed to my presence (as I stayed there for about an hour during which time the parents fed the young about every quarter of an hour) and flew direct to the site without any fuss.

On the thirty-first I visited them again, the young birds being still in the nest, but pushing their heads well out whenever they heard the parent birds coming with food. It was between this date and August 4 that they left the nest, as on visiting the site on the latter date they had gone, but I saw one of the parents in a field not far off and have no doubt the young were there also, but I was unable at the time to go after them. I left Hatley shortly after and did not return until the twenty-sixth, when I again visited the site, but failed to find either the parents or young, but Mr. Raeburn has since told me that he saw them on several occasions near his house up to the fifteenth of the month, after which date they disappeared and were not seen again, so that this would account for my failing to find them on the twenty-sixth.

As regards other instances of this handsome and interesting bird having been seen in the district is one noted by Dr. Brown about three years ago at Burroughs Falls, which is not so very far from Ayers Cliff, and Mr. Greer tells me that his brother also saw one some twelve years ago or more near North Hatley. Mr. Stephen Clarke of Hatley Centre has a mounted adult bird, which he shot on his farm about ten years ago, in the month of September, and he also tells me that he had seen one other example some years previously.

150. *Antrostomus vociferus vociferus* (Wilson). WHIP-POOR-WILL. Uncommon summer visitant; May to September. To give the exact status of the Whip-poor-will at Hatley is not an easy matter owing to the secretive and nocturnal habits of the bird. Personally I have only seen one example on the evening of June 30, 1916 (when driving home from Coaticook a bird flew across the road from the outskirts of a large wood which I was enabled to identify as belonging to this species), but this may

be partly accounted for, seeing that I am a home bird and very rarely go out at night, still it cannot be plentiful or surely I should have flushed a bird or two in the daytime, during my constant field work for the past seven years. In the summer of 1917 two notices appeared in the local papers to the effect that the bird had been heard not far from Hatley on the Waterville road, and also at the head of Lake Massawippi near Ayers Cliff, and this unfortunately is the sum total of my data regarding the status of this most interesting and useful bird in the neighborhood of Hatley. Mr. Greer tells me he has never had one of them brought to him to mount, during his nineteen years residence in these parts, which is some indication that the birds are rarely obtained.

151. **Empidonax flaviventris** (Baird). YELLOW-BELLIED FLY-CATCHER.—Rare transient; June 5, 11; September 1. My first acquaintance with this interesting little Flycatcher was on the above date in September, 1916, when I obtained an example which was the only one seen that year. On June 5 of the following year I secured another and this with the one already mentioned were sent in the flesh at the time and given to the Victoria Memorial Museum at Ottawa. It is probable that this species may breed here on rare occasions for on the latter date given in June I came across two more, which gave me the impression that they were a pair and might be nesting in the locality, which was of a moist nature with mossy hummocks about and entirely suited to their requirements. However, I was unable to find the nest at the time nor did I see the birds again at subsequent visits, or any in the fall.

152. **Loxia curvirostra minor** (Brehm). AMERICAN CROSSBILL.—Irregular winter visitant, sometimes common. I have not yet had the pleasure of coming across this interesting bird so far myself, but Mr. Greer tells me that he had two mounted ones (a pair) in his collection before it was destroyed by fire, and has seen them in large flocks on several occasions, more especially during one winter when they and Pine Grosbeaks were unusually numerous.

153. **Loxia leucoptera** (Gmelin). WHITE-WINGED CROSSBILL.—Rare and irregular winter visitant; August 31, October 27. On August 31, 1916, which is an early date for this species, I saw two strange birds feeding on the seeds of a tall hemlock tree in an open space of a somewhat large wood. Of these I secured one which turned out to be a female of the above species, and was sent in the flesh and given to the Victoria Memorial Museum at Ottawa. None were seen again until October 27, when out of a flock of fifteen I secured a young male. In describing the status of the Crossbills in Maine the late Mr. Ora W. Knight in his 'Birds of Maine' 1908, p. 376, uses the following words: Eccentric; Erratic; Irregularly Sporadic; and what better could be found to sum up the wandering nature of these curious birds. Mr. W. E. Greer of Hatley Centre informs me that he has only met with this species on one occasion in the nineteen years he has resided in the district.

154. **Progne subis subis** (Linnæus). PURPLE MARTIN.—Rare tran-

sient. Mr. Greer tells me that some twelve or fifteen years ago, he had a small martin house erected on his farm at Hatley Centre one summer, in order to try and induce a few martins he had noticed the year before to remain and breed. This house, however, became tenanted by Tree Swallows before the arrival of a pair of martins, which after investigating and hanging round for a few days, during which time sundry fights for the possession of the house took place, eventually left, as the Tree Swallows could not be ejected. At intervals since then Mr. Greer has seen odd pairs now and again, and as late as 1917 a pair were seen for one day only. It is evident from the above that a few stray birds pass through this district now and again, but neither Mr. Greer or myself know of any breeding records, nor do we think it at all likely that any exist in the immediate neighborhood.

155. *Vermivora rubricapilla rubricapilla* (Wilson). NASHVILLE WARBLER.—Rare summer visitant; May 23 to September 22. Eggs, June 15. My first acquaintance with this interesting species was on August 16, 1916, when an example was obtained and sent to the Victoria Memorial Museum at Ottawa see 'The Auk,' Vol. 34, 1917, p. 214. I next saw the species on May 23 of the following year and from then to June 2 nineteen examples were noted, see 'The Auk,' Vol. 34, 1917, p. 484. Out of this number apparently only one pair remained behind to breed (as no others were seen during the summer) the female being seen with building material in her beak on June 5. It was not however, until June 15 that their nest was located at the foot of a spirea bush on a little mound, well sunk into the surrounding hair cap moss (*Polytrichum commune*) and dwarf cornel or bunchberry (*Cornus canadensis*) of which the mound was carpeted. It was entirely hidden from sight and would never have been found had I not flushed the female from her set of five eggs. The nest was composed outwardly of some moss and fine dried grasses, the lining consisting of very fine grasses, hair like rootlets and some pine needles, the dimensions being as follows, viz.; outside diameter 3, inside $1\frac{3}{4}$ inches; outside depth $1\frac{3}{4}$, inside $1\frac{1}{8}$ inches. The eggs were nicely and evenly marked and zoned at their larger ends, the average dimensions of the five being $.56 \times .46$. On several occasions when I observed the female with building material in her beak, she was accompanied by the male who always flew into a tamarack tree and commenced to sing (and I often saw him in it afterwards) and it was not far from this tree that the nest was eventually found. I am of the opinion that the male does very little if any nest building, contenting himself with following his partner about on foraging expeditions and singing the while no doubt to encourage her.

In the fall I only saw two examples, one on September 1, and the other on the 22d, but this may be partly accounted for no doubt from the fact that I was absent from Hatley between the thirteenth and twenty-fifth of August, although I am inclined to think (judging from past experience) that the number seen in the spring was abnormal and was due to an unusual wave of the species.

156. *Vermivora peregrina* (Wilson). TENNESSEE WARBLER.—Rare transient; May 26–27. For the past six years I have been anxiously looking out for this warbler without success until May 26, 1917, when three examples were observed, out of which I secured two, and presented them to the Victoria Memorial Museum at Ottawa. The following day I saw another, thus making a total of four only for the year, as none were seen in the fall. The last example was by itself, but the other three were in the company of a mixed flock of other warblers, consisting of one Blackburnian, one Bay-breasted, one Chestnut-sided, two Nashvilles and several Myrtles and Magnolias, as well as a few Ruby-crowned Kinglets.

157. *Dendroica tigrina* (Gmelin). CAPE MAY WARBLER.—Rare transient; May 22–30; August 27 to September 12. My first acquaintance with this striking and usually rare warbler was on August 28, 1916, when an example was obtained as well as another on the thirtieth, both being given to the Victoria Memorial Museum at Ottawa. Two others were seen on the former date as well as one on September 12, making a total of five for that year. In the following spring they were first seen on May 22, and from that date to the thirtieth a total of twelve were observed, three of this number being obtained and again given to the Museum at Ottawa. In the fall they were first noticed on August 27, and from that date until the first of September another seven were noted, making a total of nineteen for 1917, or twenty-four for the two years. They were never very difficult to approach and could generally be found frequenting a certain restricted area. On one occasion I obtained a snapshot of five males and one female in a little tamarack tree, this female, if I remember rightly, being one of the only three seen out of the above total of twenty-four birds. It is a curious fact (not fiction) that the last example seen of this warbler in 1916 was on September 12, and it flew out of the very same birch tree, in which a week later I found the Myrtle Warbler imbibing sap (see 'The Auk,' vol. 34, 1917, pp. 484–485) from sapsucker holes. Could it have been engaged likewise I wonder?, for I have since learned that it has been recorded as doing so on New Providence, Bahamas, see 'The Auk,' Vol. 30, 1913, p. 155.

158. *Dendroica striata* (J. R. Forster). BLACK-POLL WARBLER.—Rare transient; May 28. The only occasion on which I have come across this warbler was at Ayers Cliff,—about six miles from Hatley, on the above date in 1917, when in a small alder bush near the junction of the river Tomifoby with Lake Massawippi, an adult male was seen at close quarters for several minutes, making identification absolutely sure.

The elevation of this spot is only some 550 feet above sea level, which is a low one for migrating Black-polls in these parts I imagine, judging from Allen's 'Birds of New Hampshire,' 1903, pp. 57–58, 163–165, in which we are told that the Black-polls at all events in the central and northern parts of the state are only found migrating through the White Mountains at an elevation of 2000 to 4000 feet or more, and the same thing occurs, I believe, in the Green Mountains in Vermont. Judging then from my experience, it looks as though none of the vast multitude of Black-polls

passing through these states reach their breeding grounds in the far north by way of Hatley, unless possibly by keeping to the tops of the Bunker and Massawippi hills at an elevation of 1400 feet, which theory I am not inclined to favor at present, in the absence of any further published records of the appearance of the birds until we reach Montreal and Quebec, my friend, Mr. L. M. Terrill, informing me that he did not observe it at Bury, a village some thirty-five miles to the northeast of Hatley. What I think is far more likely to be the case, is that the birds passing through New Hampshire branch off at Lancaster or thereabouts as their most northern point, and pass up through central and eastern Maine to New Brunswick, Nova Scotia and the Gaspé Peninsula, from whence they cross to the Magdalene Islands, Anticosti and Labrador, whilst those from Vermont evidently take a westerly course probably through the northern portion of the state of New York, and thence across the St. Lawrence and through Ottawa to the north, but this line of migration is not nearly so well defined as that through Maine. Dionne speaks of it as a rare migrant in spring at Quebec, Wintle as an irregular spring migrant at Montreal, and says he has not met with it in autumn, whilst Terrill writes me that he meets with it there commonly in the fall, but irregularly in the spring. From this it looks as though the spring wave rarely reaches Quebec or Montreal, but in the fall some of the returning birds pass through these two places on their way south. This state of things seems to entirely favor my theory that Black-polls do not pass through Hatley or the eastern townships in the spring at all events, and as regards the fall when young of this species might be mistaken for young of the Bay-breasted Warbler, I have on several occasions when any doubt, existed, shot the birds, but they have always turned out to belong to the latter species. Taking Montreal and Quebec as a base line and Hatley as the apex, the territory inside this triangle is practically virgin ground, and awaits its quota of good observers to settle some of these interesting problems.

159. *Seiurus noveboracensis noveboracensis* (Gmelin). WATER-THRUSH.—Rare summer visitant, fairly common transient; May 19–28 (summer); August 26 to September 8. My first acquaintance with this species was on August 26, 1916, when one example only was seen and obtained. In the following spring two more were obtained in May and given to the Victoria Memorial Museum at Ottawa, and six others seen; (five of this latter number at Ayers Cliff) but in the fall only one was again noted the same as the previous year, thus making a total of ten examples for the two years. Mr. Greer of Hatley Centre tells me that on one occasion in summer he came across a parent bird feeding young near Massawippi Lake, and on this information I have ventured to include the bird as a summer visitant on rare occasions. It will be noticed that one half of my records were obtained at Ayers Cliff, which is in the immediate vicinity of the lake, and I quite think the species is more plentiful there owing to its damper surroundings than it is at Hatley.

160. *Anthus rubescens* (Tunstall). AMERICAN PIPIT.—Not com-

mon transient; September 22-26. On the morning of September 22, 1917, I had only crossed one field after leaving home, when I observed a strange bird on the fence rails, which I at once knew must either be a Pipit or a Wagtail from my experience of these species in the 'old country.' I secured the example and found it to be an American Pipit. At the report of the gun another fourteen got up and started to fly away, but returned almost at once on my whistling them, which enabled me to view them at close quarters. Two days later I saw another flock of eleven securing one, which with the other I presented to the Victoria Memorial Museum at Ottawa. On the last date given above I only saw one example.

161. **Troglodytes ædon ædon** (Vieillot). HOUSE WREN.—Rare transient; May 19; August 6 to September 22. In August of 1915 I got a fleeting glance of a wren which I took to be one of this species, but did not consider identification sufficiently good to include it in my 1911-1915 list. However in the following year from August 11-15, I got on intimate terms with one of these birds, and visited him every day between these dates. He generally commenced by scolding me well, but on two occasions ended up with a little song, but nothing I imagine to be compared with his spring achievement in this line. He also had a pretty way of basking in the sun with his breast pressed closely to the branch or log, when he would put one leg under his wing, and extend it to its fullest extent. On the above date in May, 1917, I saw just one example which I secured and gave it to the Victoria Memorial Museum at Ottawa. In the fall of the same year on August 6 and 10, I again saw an adult bird (practically in the same place each time), feed an immature well able to fly. Two other examples were seen, one on August 31, and the other on September 22. The above notes should prove interesting in view of the rareness of this wren in eastern Quebec, out of which no doubt it has been driven by the advent of the English Sparrow, the same as it was in Maine.

162. **Cistothorus stellaris** (Naumann). SHORT-BILLED MARSH WREN.—Rare transient. May 21. On the above date in 1917, I saw one of these birds near a small stream running through the center of a damp meadow much overgrown with long rank tussocky grass and some alder bushes, and although I had my gun with me at the time, I must admit I was so surprised at seeing a new wren and one decidedly rare for these parts, that I failed to fire when I had the chance, and the bird slipped away amongst the long grass, and I was unable to find it again. In spite of my inability to produce the example I give the record as I know I neither confused it with a Winter or a House Wren, both of which I am familiar with, and whilst the general ochraceous buffy appearance of the bird with its short bill was still fresh in my mind, I went directly home (as the meadow was not far off) and after looking up plate No. 102 in Eaton's 'Birds of New York' 1914, I had no misgivings in my own mind that what I had seen was one of the above species.

163. **Penthestes hudsonicus nigricans** (Chas. W. Townsend).

LABRADOR CHICKADEE.—Rare transient; May 14–30, September 3–21, (October 10 to November 12). Time was when I could not have told *nigricans* from *littoralis* in the field, but that is past history now, and probably I have had as much experience in the field with the former as any one, so that when a couple of Hudsonian Chickadees came into sight today, October 10, 1917, at close quarters, I had no difficulty in seeing that they were *littoralis* and not *nigricans*, not so much from the fact that their backs were brown instead of dusky, the caps undifferentiated, and the sides of a strong brown tint, but from their behavior and the tone of their voice, which was entirely different to that of any *nigricans* I have so far come across. The same wheezy note was certainly there but it was stronger and more insistent than in *nigricans*, which in my experience is a very feeble wheeze, and as regards their behavior they came close down to me of their own accord, and when whistled, the same as *atricapillus* will, whereas I have never been able to induce *nigricans* to do so, in fact it has always been difficult to get a shot at these latter owing to their nervous and restless state. In my 'Birds of Hatley' (Auk, Vol. XXXIII, 1916, p. 184) I record two Acadian Chickadees (*littoralis*) which from my late experience I can now assert to be correctly named, and as regards the two Hudsonian Chickadees (*Penthestes hudsonicus* subsp.?) (Auk, Vol. XXXIV, 1917, pp. 215, 217). I have no hesitation in saying they were *nigricans* but as will be seen, the dates, October 10 to November 12, have been inserted in brackets. Returning to *nigricans* I first became acquainted with the species on May 14, 1917, when two examples were secured, and sent in the flesh to Dr. Townsend for verification. Two days later another was obtained and also sent to the same authority. These three proved to be adults, two males and one female. On the twenty-first three more were obtained and one on the thirtieth, which were all sent in the flesh and given to the Victoria Memorial Museum at Ottawa (proving to be two males and two females, see 'The Auk,' Vol. 34, 1917, pp. 486–487) which institution at the time possessed only one example, and that not a Canadian taken one. No more were seen until the very early and no doubt record "fall" date of September 3, when two were obtained and sent to Dr. Townsend, but owing to a delay in the mails, they were unfortunately not in a fit state to preserve on arrival. Another male was secured on the thirteenth and again given to the Museum at Ottawa. Altogether from May 14 to September 21, sixteen examples were seen, and without exception, as already stated, they were restless and difficult to approach, especially amongst the firs which they always frequented either alone, or in the company of flocks of Golden and Ruby-crowned Kinglets, generally the former.

SYNOPSIS OF PRINCIPAL EVENTS. YEARS 1916-1917.

1916.

Pine Grosbeaks again made their appearance after an absence of three years. Evening Grosbeaks also seen. Black-throated Blue and Black-throated Green Warblers found breeding. Cedar Waxwings unusually plentiful and nesting in small communities. Goldfinches also plentiful and seen for the first time in every month of the year. Red-eyed Vireos more numerous again, than during the past three years, other vireos rare or absent.

Kingbirds very scarce. Olive-backed Thrush found breeding for the second time. Purple Finches more numerous than ever before. Sharp-shinned Hawk wintered at Hatley. Bronzed Grackles first invaded Hatley Village and nested there. Obtained a fine example of Wilson's Warbler, second one only seen in seven years. Found Myrtle and Black-throated Blue Warblers taking sap from sapsucker holes, and possibly the Cape May as well. White-winged Crossbills seen for the first time, and a female obtained on the early date of August 31. Nashville Warbler and Water-Thrush also seen for the first time. Black-capped Chickadees and White-breasted Nuthatches more plentiful than usual.

1917.

Evening and Pine Grosbeaks again present, the flocks consisting of a much larger proportion of full plumaged males than usual. Early date for arrival of Savannah Sparrow, March 30. One example of Short-billed Marsh Wren seen May 21. White-crowned Sparrow unusually numerous. Nashville and Black-burnian Warblers found breeding for the first time, also Meadow-lark, Red-headed Woodpecker and Marsh Hawk, the latter on May 10, an early date for this species. Obtained first spring records for Cape May and Nashville Warblers, also Wilson's Snipe, and first fall records for Woodcock and Yellow Palm Warbler, the first being the second bird only (Woodcock) seen in seven years. Black-poll (one only) and Tennessee Warblers (four) seen for the

first time. Pair of Indigo Buntings seen on June 4, the second only in seven years. Migrant Shrikes spreading and three pairs located breeding as against one only in previous years. Late date for departure of Cedar Waxwings, October 9.

Obtained a small series of Dr. Townsend's new subspecies, the Labrador Chickadee, both in spring and fall, the early date of September 3 being no doubt a record one for the latter season. Two Acadian Chickadees seen on October 11, making four only for seven years. Northern Shrikes somewhat numerous at the end of October. One Yellow Palm Warbler seen on November 8, a late date, which remark also applies to a Crow seen on December 6. Two Brünnich's Murres shot on the Massawippi river on December 10, after an easterly gale. Months of November and December noticeable for the almost entire absence of winter birds.

For the convenience of those wishing to see at a glance, exactly what birds may be found at Hatley, I have prepared the following list, marking with an asterisk the seventy-seven species, whose nests, eggs or young have actually been found, and with a dagger the fifteen, some of which are known, and others believed to breed more or less regularly, but whose nests, eggs or young have so far escaped detection. It may also be mentioned that of this list thirteen species are Residents, seventy-four Summer Visitants, sixty-four Transient Visitants, whilst the balance or remaining twelve are Winter Visitants.

Pied-billed Grebe	Canada Goose
Loon	American Bittern*
Brünnich's Murre	Great Blue Heron
Kittiwake	Little Green Heron
Herring Gull	Black-crowned Night Heron
American Merganser	Virginia Rail
Red-breasted Merganser	Sora*
Hooded Merganser	American Woodcock
Black Duck	Wilson's Snipe
Green-winged Teal	Pectoral Sandpiper
Blue-winged Teal	Least Sandpiper
Wood Duck	Semipalmated Sandpiper
American Golden-eye	Greater Yellow-legs
American Scoter	Yellow-legs
Snow Goose	Solitary Sandpiper

Bartramian Sandpiper*	Prairie Horned Lark*
Spotted Sandpiper*	Magpie
Killdeer	Blue Jay*
Semipalmated Plover	Canada Jay
Canada Spruce Grouse†	Crow*
Canada Ruffed Grouse*	Bobolink*
Turkey Vulture	Cowbird*
Marsh Hawk*	Red-winged Blackbird*
Sharp-shinned Hawk†	Meadowlark*
Goshawk	Baltimore Oriole*
Red-tailed Hawk	Rusty Blackbird
Red-shouldered Hawk*	Bronzed Grackle*
Bald Eagle	Evening Grosbeak
Pigeon Hawk	Pine Grosbeak
Sparrow Hawk*	Purple Finch†
Osprey	English Sparrow*
Long-eared Owl*	American Crossbill
Short-eared Owl	White-winged Crossbill
Barred Owl†	Redpoll
Great Grey Owl	Goldfinch*
Richardson's Owl	Pine Siskin*
Saw-whet Owl†	Snow Bunting
Screech Owl	Vesper Sparrow*
Great Horned Owl†	Savannah Sparrow*
Snowy Owl	White-crowned Sparrow
Hawk Owl	White-throated Sparrow*
Black-billed Cuckoo*	Tree Sparrow
Belted Kingfisher*	Chipping Sparrow*
Hairy Woodpecker*	Slate-colored Junco*
Downy Woodpecker*	Song Sparrow*
Arctic Three-toed Woodpecker	Swamp Sparrow*
Yellow-bellied Sapsucker*	Fox Sparrow
Northern Pileated Woodpecker†	Rose-breasted Grosbeak*
Red-headed Woodpecker*	Indigo Bunting*
Northern Flicker*	Scarlet Tanager*
Whip-poor-will†	Purple Martin
Nighthawk	Cliff Swallow*
Chimney Swift*	Barn Swallow*
Ruby-throated Hummingbird†	Tree Swallow*
Kingbird*	Bank Swallow*
Crested Flycatcher*	Cedar Waxwing*
Phoebe*	Northern Shrike
Wood Pewee†	Migrant Shrike*
Yellow-bellied Flycatcher†	Red-eyed Vireo*
Alder Flycatcher*	Warbling Vireo*
Least Flycatcher*	Yellow-throated Vireo*

Blue-headed Vireo*	Canada Warbler*
Black and White Warbler*	Redstart*
Nashville Warbler*	American Pipit
Tennessee Warbler	Catbird*
Northern Parula Warbler*	House Wren
Cape May Warbler	Winter Wren*
Yellow Warbler*	Short-billed Marsh Wren
Black-throated Blue Warbler*	Brown Creeper†
Myrtle Warbler*	White-breasted Nuthatch†
Magnolia Warbler*	Red-breasted Nuthatch†
Chestnut-sided Warbler*	Chickadee*
Bay-breasted Warbler	Acadian Chickadee†
Black-poll Warbler	Labrador Chickadee
Blackburnian Warbler*	Golden-crowned Kinglet
Black-throated Green Warbler*	Ruby-crowned Kinglet
Pine Warbler	Veery*
Yellow Palm Warbler	Olive-backed Thrush*
Ovenbird*	Hermit Thrush*
Water-Thrush*	Robin*
Maryland Yellow-throat*	Bluebird*
Wilson's Warbler	(163 species)

HOME LIFE OF THE VESPER SPARROW AND THE HERMIT THRUSH.

BY E. M. AND W. A. PERRY.¹

ONE summer at Douglas Lake, Michigan, the Biological Station of the University of Michigan, we had an opportunity of studying the nesting habits of the Vesper Sparrow and the Hermit Thrush. The results of my observations are presented below.

I.

THE VESPER SPARROW.

One usually associates the Vesper Sparrow with large, grassy fields and dusty roadsides. The region in which I made my study

¹ Observations were made by E. M. Perry, article was prepared by W. A. Perry.

was of a very different character. It had been cleared of the original forest of pines, and further denuded by forest fires. The ground was still strewn with charred logs and stumps. Here and there a tall, charred skeleton of a tree trunk towered high in the air. The living vegetation consisted of scattered tufts of blue grass; shrubby growths of aspen, huckleberry, sumac, and bracken, and a few taller trees of oak, aspen, and maple. One of the two nests that I observed was quite well hidden by a small blackberry bush, some tall blue grass, and a few brackens; the other was under the drooping branches of a sumac.

Previous to the hatching, I used to visit the nests every day. They were simple structures consisting of shallow basins in the earth, made by the sparrows themselves; a coarse lining of the stems of bracken; and a softer lining of blue grass. Four white, brown-blotched eggs were laid in each nest. Only three of the four eggs hatched in each.

As soon as the first bird began to peck its way out of the shell, I devoted from six to nine hours a day for eight days to observation. I used as a point of vantage a blind, or tent, four feet square, pitched within about thirty inches of the nests under observation. I had cut a slit three or four inches long in the side toward the nests for an observation window, and another, lower down, for the protrusion of the camera lens. I had to avoid making the slightest noise or any movement across the window.

In order to determine the duties of the different sexes, I tried to distinguish the male from the female; but that is not an easy matter when the plumages are practically identical. After a day or two, however, I found that I could differentiate the parents by the shade of the back feathers, or the loss of such prominent ones as the white outer tail feathers. I am not sure that my distinction of the sexes was correct, but I give the results of my observation according to that distinction.

From the first the sparrows were clean nest-keepers. Their work began as soon as the young cast aside the shells. These were not allowed to litter the nest, nor were they scattered carelessly about. They were simply eaten by the parents while at the nest. One parent did take a shell some few feet away from the nest before eating it. The shell seemed brittle and broke into many fine bits. These were all carefully picked up. Ants were numerous and

were a'ways crawling through the lining and into the nest. I often used to see the parents perched on the nest, with most of the upper part of the body hidden as they searched through the wall for retreating ants. Frequently the wind blew bits of leaves or grass into the nest. These were never allowed to remain. The excreta of the young never soiled the home; it was eaten by the parent as soon as the nestling evacuated it from the cloaca. Consequently the nest looked as clean when the family left as it did the first day of its use.

Another duty of the sparrow parents was that of brooding. The greater amount of this was done by the one I took to be the female. In the second nest neither parent did much brooding, but the male did none. During the hottest part of the day the female, her mouth agape, often stood up in the nest with wings outspread to keep the heat of the sun from the nestlings. While I was observing the first nest, there was a heavy, driving rain storm that lasted nearly two hours. The female did duty then. She brooded facing the storm, the water running off her back in rivulets. She was a drenched bird when the storm decreased and the dry male came to relieve her. The nestlings, however, were perfectly dry.

A third duty was that of feeding the young. The parents were kept busy bringing food on an average of every twenty minutes for the first few days. This interval decreased to ten by the fifth day, and then slightly increased to the seventh day. In the first nest the ratio of feeding was 11:7 in favor of the female, in the second, it was 2:1. The parents brought grasshoppers, crickets, katydids, sawfly larvæ, and some hairy larvæ I could not identify. I rather thought they selected small specimens when the birds were small. At times, however, they brought such large grasshoppers, with legs and wings missing, that the young could swallow them only with much struggling. The parent bird always placed the food well down the throat of the nestling by inserting its own mandible into the mouth. Often the nestling still held its mouth agape after the food had been placed in it and did not seem able to swallow for a few seconds. The mother of one of the families had a difficult task in getting any of the nestlings to swallow a large brown caterpillar. She placed it into mouth after mouth and then tried all

over again. The larva by this time was torn and dripping. One of the nestlings findly swallowed it in this condition.

A fourth duty had to do with guarding the nest. In order to keep the location of the nest a secret, the parents rarely flew directly to the nest or away from it. Even when they were frightened, they usually took time to hop away a short distance before flying. They approached the nest by comparatively definite routes. They would alight some ten or fifteen feet away. Then they would hop up slowly, stopping now and then on some observation point, such as a stump or fallen log, look around, call "Neen, neen," and then hop up on one particular side of the nest's rim.

All the activities of the parents seemed to be part of a definite routine. This call, "Neen, neen," seemed to be a signal call. If one of the pair was at the nest when the other called, it hurriedly left. Both parents were never found at the nest at the same time during my observation. I have even seen a parent engaged in feeding, leave without completing the task when this call was given by the other. Each parent waited after feeding the nestling for it to mute, and then seizing the excreta, would either swallow it or leave with it in the mandibles. After feeding the nestlings, the parent sometimes brooded until compelled to leave at the call, "Neen, neen." There was no variation in their routine except in the intervals between feedings, a decrease in the amount of time spent in brooding, and the breaking of the schedule caused by storms or other interruptions beyond their control.

One day in the first nest, the brooding female flew directly from the nest. This was such a pronounced breaking of custom that I craned my neck to see what exceptional event could warrant the act. I saw her a few feet away trailing her wings on the ground as if injured. A short distance from her was a garter snake. I could not wait to see the outcome of what seemed like a pending tragedy, but killed the enemy immediately. Realizing that my observations might come to a premature end if another snake should be in search of a dinner while I was absent, I placed around the nest a circular fence of close-meshed wire 18 inches high and about 10 feet in diameter. I then thought that this would keep out snakes. I now doubt its efficiency.

Soon after I had placed this fence around the nest, the male

approached in the usual manner of hopping toward the nest. When he reached the fence, he ran around it looking for an opening. He had to do this several times before he felt positive that he could not get through. He then became alarmed, and disappeared from my view for about twenty-four hours. The female was more determined than the male. It took her two hours before she felt convinced that there was no opening. She then flew over. My day was drawing to an end. So I picked up my camera, pocketed my note book, and went home, feeling confident that I had provided against the danger of further snake enemies, and that the female now knew how to reach her young.

The next morning when I came to the nest, I found what I feared was a castastrophe. There lay three cold, limp, apparently lifeless birds. I cast aside the fence and entered my tent, heartsick. The nestlings had been starved and unbrooded all the chill night through. In a little while the female came to the nest and in her efficient manner proceeded with the only sane treatment possible. She brooded in a quiet, untiring way for four uninterrupted hours. Finally hunger drove her forth. Then, still feeling guilty, I looked in and found all three nestlings able to move about. By noon they were again keeping the parent busy bringing food, and since the male did not appear all day, it was a double task for her.

The second family also had a snake visitor that I had to kill. There seems little doubt that many young birds, especially those that live in nests on the ground provide food for snakes. Even after they leave the nest, they are likely to be attacked. I visited the first nest the day after the nestlings left. I had about decided that there was nothing to see but the chirping parents in the nearby trees, when I heard a screaming "Zee, zee," and saw the parents flying about in distress. Hurrying out, I found a nestling held in a snake's jaw. The snake wriggled away, and the bird lost itself in the grass. I felt that the snake would come back. So I waited until I again heard the call. This time I succeeded in killing the snake and in capturing the bird. It had a jagged tear on its thigh where the snake's teeth had held it. I put it in the nest, but it would not stay.

The objects of all this parental care and of much of my interest were hatched blind and entirely naked, with the exception of a row of short down feathers extending from the crown of the head to the

tail. They were able from the first to raise their large heads on their long, wobbly necks, and open their mouths for food. In fact, they seemed able to do this before the down had scarcely dried. They soon became rather active, ill-mannered, aggressive nestlings, squabbling over their food. Their bodies began to be marked with distinct feather tracts. On the third day the wing pins had broken through the skin. Their eyes began to open about this time, and they could make a faint call. This became a loud "zee, zee" by the sixth day. They no longer remained quietly huddled in the bottom of the nest, but began to assume a definite position, with their heads resting on the rims of the nest, their breasts against the sides, and their claws firmly clasped in the lining. When they raised their heads and opened their mouths, they looked like a bowl of queer flowers. Now and then they stood up and flapped their wings. When they were six days old, they began to preen their bursting feathers. This they did by seizing each feather at the base, and drawing the mandibles over it toward the apex. This helped to remove the dried sheath.

In order to estimate the rapidity of their growth, I weighed them every day. Since they soon became too active to keep on the scale pan, I made a cheese cloth bag to put them in while I weighed them. To distinguish one from another, I marked them with paint on different parts of the body. Having the birds marked also gave me an opportunity of determining if the parents fed them impartially. I decided that they fed indiscriminately. The nestling stretching out its neck the longest, received the most food. In spite of this, however, the following table shows an approximately equal increase in the weight of each of the three.

TABLE I.

SHOWING WEIGHT IN GRAMS OF NESTLINGS FROM DAY TO DAY.

Date	July 19	July 20	July 21	July 22
Bird I	2.92	4.82	7.48	9.07
Bird II	2.85	4.76	7.23	8.87
Bird III	2.66	4.23	5.83	8.48
Number of times food was brought to nest	16	23	27	35
Weather	Warm Clear	Cool Cloudy	Cool Cloudy	Clear Cool

Table I continued.

Date	July 23	July 24	July 25	July 26
Bird I	13.41	15.62	16.98	17.30
Bird II	13.22	14.97	16.01	left nest
Bird III	12.23	14.45	16.88	16.88
Number of times food was brought to nest	50	46	29	
Weather	Rainy Rained in A.M.	Rainy	Cloudy Threatening	Clear

When the nestlings were eight days old, although they were not well feathered, the parents coaxed them from the nest. This they accomplished by calling "Chirp, chirp" near the nest, sometimes with and sometimes without food in their mandibles, and then waiting until a nestling hopped out. As soon as the nestling approached, they retreated a few feet and then again waited. If the nestling seemed disinclined to continue following, the parents went back near it and again called "Chirp." The nestling would probably start to follow. By a continuation of this process the parents of both nests enticed the young from the homes into the surrounding grass and shrubs while they were still unable to fly, and their only method of locomotion consisted of clumsy hopping. I could now see why the young had begun to assume the position I have before mentioned. This is the preparatory position for climbing out of the nest. Since the young seemed so helpless, I several times put them back into the nest. They only screamed when I touched them and again hopped out, ready for the adventures of the world.

II.

THE HERMIT THRUSH.

The nest of the Hermit Thrush was about a mile from those of the Vesper Sparrows. It was on much lower ground, near a bog. The vegetation was similar, except that the trees were much taller. It was placed in a shallow depression of the sandy soil, at the bases of a dwarf honeysuckle and several tall brackens, and extended above the surface of the ground about an inch and a half. It

was much more neatly constructed than were the sparrows' nests. The same building materials were used bracken stems and blue, grass, with the addition of a lining of pine needles. A few oak leaves on the margin helped to hide it from view, since the surrounding surface, too, was strewn with oak leaves. The nest contained four greenish blue eggs when I first discovered it.

As soon as the eggs began to hatch, I had the tent pitched and began to study this family as I had studied the sparrows. My first discovery was that I had a much shyer bird with which to deal. I sat through the first day, waiting in vain for the parents to take care of their young. Neither one came to the nest from morning till noon, nor from noon until 5 P. M. All I saw for my watching was four weak heads raised every now and then on unsteady necks, and four yellow, opened mouths close unfed. Fearing that the parents might desert the nest, I left at 5 P. M. Toward evening I returned. The nestlings were cold, and had not been fed or brooded, I believe, since I left. I had the blind removed. Since the young were warm and in good condition the next morning, I had the blind pitched a second time. This time I cut a few leafy branches and placed them over the window end, to cover up any perceptible movement across the slit. I accomplished little more the second day than I had on the first. The parents approached the nest with food, but never became quite courageous enough to enter the home. On the third day I found that the parents had decided to conduct the affairs of their household regardless of the introduction of a staring white tent right beside their nest.

I could not distinguish the parents from each other until the fifth day. I then found that one had a much grayer back, lores, and mid-tail feathers than the other. I called this the male.

Their manner of conducting their home duties was so similar to that of the sparrows that they might well have been the same family. For a while I felt that they were not such clean nest-keepers. One of the nestlings had died the second day from a rupture near the anal opening, and was left in the nest until it swarmed with ants that came to feed upon it. On the fifth day, while I was away, it and all the excrement that had been allowed to accumulate were removed. No doubt this apparent laxity was due to the birds being disturbed. From then on, at any rate, everything was kept clean. The Hermit Thrushes removed the

excreta, ants and egg-shells just as the sparrows did. The female did most of the brooding. Neither parent did much. The female also did the greater part of the feeding. The food selected by the parents for the young consisted entirely of insects either in the larval or adult state. Katydids, grasshoppers, crickets, sawfly larvæ, robber flies, a few hairy caterpillars, and a moth or two made up their food. I noticed such a variation in the gain in weight of the different nestlings that I marked them on the head with paint in such a way as to distinguish one from the other, so that I could determine whether the parents fed impartially. Table II shows the number of times, from August 7 until August 9, that each bird was fed.

TABLE II.

FEEDING PERIOD.

Each figure in the table gives number of feedings for each period.

Period of Observation	August 7 1: 20-3: 00	August 8 7: 05-11: 15	August 8 12: 15-3: 0	August 9 7: 05-10: 30	Total
Bird I	4	11	4	5	24
Bird II	5	12	2	10	29
Bird III	3	9	4	3	19
Total	12	32	10	18	72

Each figure in the table gives number of feedings for each period. The parents fed indiscriminately. Bird III did not receive as many feedings as the others and therefore lost a greater amount in weight. Bird II received the most feedings and his weight from August 7 to 9 shows a gradual increase. Table III shows the share each parent took in caring for the young in so far as I was able to distinguish them. I could not distinguish them until the fifth day.

Their method of approaching and leaving their nest was like that of the sparrows. The first few days neither parent gave a call when approaching, and it was only by close watching that I could tell that they had visited the nest. Often, however, they gave a deep, throaty "Cluck" when on the nest's rim. Soon they began to give a robin like "Chirp" or a "Neink, neink" call, when some distance from the nest. This was taken by the bird on the nest as a signal to leave. One day the male was having difficulty inducing

TABLE III.

DETAILS OF FEEDING, BROODING AND OBSERVATION.

Age of Young	July 30 1 day	July 31 2 days	Aug. 1 3 days	Aug. 2 4 days	Aug. 3 5 days	Aug. 4 6 days	Aug. 5 7 days	Aug. 6 8 days	Aug. 7 9 days	Aug. 8 10 days	Aug. 9 11 days	Total
Fed by Female in A.M.	0	0	*7(♂ & ♀)	*12(♂ & ♀)	13	14	17	5	17	22	13	101
Fed by Female in P.M.	0	*4(♂ & ♀)	*4(♂ & ♀)	*8(♂ & ♀)	10	12	7	11	5	6		51
Fed by Male in A.M.	0	0			6	6	5	4	9	7	4	41
Fed by Male in P.M.	0	0			2	2	6	4	4	2		20
Brooded by Female in A.M.	0	0	*2 hrs.	*1 hr.	1 hr.	1	0	0	0	0	0	0
			11 min.	5 min.	40 min.							
Brooded by Female in P.M.	0	0	*1 hr.	*1 hr.	55 min.	0	0	0	0	0	0	0
			7 min.	23 min.								
Brooded by Male in A.M.	0	0			0	0	0	0	0	0	0	0
Brooded by Male in P.M.	0	0			0	0	0	0	0	0	0	0
Rate of Feeding in A.M.	0	0	37 min.	30 min.	13 min.	12 min.	11 min.	28 min.	9 min.	8 min.	9 min.	
			51 $\frac{2}{3}$ sec.	40 sec.	35 sec.	36 sec.	35 $\frac{5}{11}$ sec.	13 $\frac{1}{3}$ sec.	36 $\frac{1}{3}$ sec.	47 $\frac{7}{29}$ sec.	3 $\frac{9}{17}$ sec.	
Rate of Feeding in P.M.	0	38 min.	42 min.	21 min.	14 min.	9 min.	12 min.	11 min.	18 min.	20 min.		
			30 sec.	20 sec.	10 sec.	39 sec.	4 sec.	0 sec.	53 $\frac{1}{3}$ sec.	37 $\frac{1}{2}$ sec.		
Period of Observation in A.M.	7.30- 11.20	7.12- 11.20	7.00- 11.25	7.15- 12.10	7.15- 11.20	7.00- 11.15	7.00-11.15	7.00- 12.15	7.15- 12.10	7.05 11.15	7.05- 10.39	
Period of Observation in P.M.	2.45 6 hrs.	2.45 6 hrs.	3.00 7 hrs.	3.00 7 hrs.	3.00 6 hrs.	2.45 6 hrs.	12.15-3.00	12.15- 3.00	12.10- 3.00	12.15-3.00		
Total Time Observed	25 min.	43 min.	15 min.	7 hrs.	55 min.	30 min.	6 hrs.	6 hrs.	7 hrs.	6 hrs. 55 sec.	3 hrs. 36 min.	72 hrs. 13 min.
Rate of Feeding during Ob- servation			min. 39	min. 21	min. 13	min. 11	min. 11	min. 17	min. 12	min. 10	min. 12	

* I had not distinguished the male from the female during the first four days of observation.

any of the nestlings to swallow a green hairy larva, and in the midst of his difficulty the female's call of "neink, neink" sounded. The male picked up the larva that had fallen from his mouth, and hurried away, just as the female reached the nest. After she had left, he came back with the same caterpillar he had taken away. I noted only one exception to this rule that the parent at the nest leave at the approach of the other. This time the male reached the nest carrying a large katydid in his mandibles. He spread out his wings and raised his crown feathers as if in anger, and pecked at the brooding female. She took the katydid from his mandibles and left by the usual route.

I thought the young Hermit Thrushes a little handsomer than the sparrow nestlings. They had long, black, downy feathers on the dorsal tract; yellow skins; and orange linings to their mouths. They began to make a faint call, "Tsit" on the second day. By the time they were four days old, the wing pins had pierced the skin, and all the other tracts on the body were pronounced. Their eyes began to open on the fifth day. They began to preen their feathers on the ninth day. By the eleventh day they were much mottled birds. The feathers were fuscous, and ochraceous buff, on the upper parts; their tail feathers all buff; the wing feathers buff on one vane, and ochraceous on the others; the throat and breast were streaked with black; and the under parts were creamy white. As they grew older, they were just as greedy as their coarser cousins, the sparrows, and screamed and stretched out their bodies toward the parent bringing the food. Table IV shows the variation in their weights from day to day.

TABLE IV.

WEIGHT OF YOUNG IN GRAMS.

Date	July 30	July 31	Aug. 1	Aug. 2	Aug. 3	Aug. 4
Bird I	4.99	4.80	6.35	9.72	14.52	16.25
Bird II	5.18	4.34	6.80	9.53	14.26	16.31
Bird III	5.83	5.57	8.42	10.72	15.81	18.45
Bird IV	4.7	4.00	Died			

Date	Aug. 5	Aug. 6	Aug. 7	Aug. 8	Aug. 9
Bird I	21.63	23.18	25.95	23.62	23.62
Bird II	19.04	21.43	22.92	26.21	26.59
Bird III	20.58	23.28	29.77	25.56	23.94

Although it was raining on the twelfth day, the nestlings began to climb out of their nest. The parents encouragingly chirped to them, a few feet away. I put the first one back. Although I had handled it every day while weighing it, now it screamed with fear. The parents forgot their timidity and flew down angrily close to my head, making a queer clicking noise. It was useless to try to prevent these little wanderers from leaving the nest. Although weather conditions were unfavorable, and they could not fly, they had to leave. The nest cycle of twelve days had been completed.

THE DISTRIBUTION OF NUTTALL'S SPARROW IN CALIFORNIA.

BY CARL L. HUBBS.

DURING the months of May, June, and July, 1916, the writer was engaged in a collecting trip along the central California coast. During the trip observations were repeatedly made on *Zonotrichia leucophrys nuttalli*, as it soon became apparent that the peculiarly restricted distribution of this sparrow had not received the full attention that its significance deserves. These detailed records are briefly presented, as they are used to establish and justify the generalizations that follow.

This White-crowned Sparrow breeds in the humid region along the Pacific Coast, occupying an area south of that inhabited by *Z. l. gambeli*. The latter subspecies migrates southward to California in large numbers, whereas *Z. l. nuttalli* undertakes no extensive latitudinal migration, merely occupying a slightly wider range during the winter months than in the breeding season.

DEFINITE RECORDS.—Dr. Grinnell has recorded the status of *Zonotrichia leucophrys nuttalli* in California as follows: "Common resident of the narrow humid coast belts";¹ "breeds south from Humboldt Bay through the San Francisco and Monterey Bay

¹ Grinnell, *Pacific Coast Avifauna*, 3, 1902, p. 52.

regions, regularly at least to Port Hartford . . . sparingly to Santa Barbara. Occurs scatteringly in winter beyond these limits, interiorly to McCloud River" and the San Joaquin Valley, "and southerly to Los Angeles" and vicinity; there has also been noted "a regular local migration within Marin County from the seacoast, where it breeds abundantly, to the interior, as at San Geronimo, where it winters plentifully."¹ It also winters abundantly in its breeding zone, for instance near Monterey.

Z. l. nuttalli occurs on the terrace between the hills of the San Francisco Peninsula and the sea. Near Monterey it bred abundantly in the tree lupines about Point Pinos before the improvement of this area; it entered the pine forests only in the open places near their coastwise margins. Along the southern shores of Monterey County the mountains of the Coast Range rise precipitously from the sea,—here our sparrow is "abundant in the narrow belt of yellow lupine (*Lupinus arboreus*) which lies along the coast from Monterey to San Carpojo [in northernmost San Louis Obispo County]. Also found as far inland as the blue lupine extends, which is sometimes two or three miles up the canyons on the shady side. Found nowhere else."² At one point along this rugged coast there is a terrace, about a half mile wide, between the cliffs and the mountains; this terrace is called "Pacific Valley," because it is the only level land in the region. A post office called Gorda is situated here, and at this secluded place the writer had the good fortune to observe Nuttall's Sparrow in the height of its breeding season, when its pleasant little song added life to the rough shore line. Although time did not permit searching for them, a number of fresh nests were stumbled onto at the edge of the cliffs: May 17, one nest with three, and one with two eggs, both placed between one and two feet from the ground in thick clumps of sage (*Artemisia californica*); May 18, one nest with two eggs, and another with two newly hatched young and one egg, both placed lower than two feet in sage; lastly a nest with two eggs, located two feet high in a blue lupine. This sparrow was entirely absent from the slope of the adjacent mountains, even at their bases, whether timbered or not (May 19).

¹ Grinnell, *ibid.*, 11, 1915, p. 117.

² Jenkins, *Condor*, 8, 1906, p. 128.

Further observations were made on this White-crowned Sparrow south of Monterey County during the summer, and while no fresh nests were found, it was abundant in all suitable localities southward to Point Conception. That the species was actually within its breeding range wherever found is evident from the following facts. The records were all taken before the end of July, and it is doubtful if migration *en masse* had occurred, especially as the subspecies makes no extensive migrations at all. The sparrow was not observed back of its breeding zone, nor on the narrow barriers which cut its range at several points, thus indicating that the breeding area was still being occupied. Finally at the various southern record stations to be given, both adults and half-grown young were seen; the bob-tailed young near Point Arguello, for instance, could hardly have moved far south along the wind swept coast. The following records then, are doubtless all within the breeding records of the subspecies.

Many individuals were seen in the sandy *Artemisia-Lupinus* belt about Piedras Blancas (May 31), but none were found near-by where the coast line is hilly (June 1-5), and none were seen in the pine forests near Cambria (May 29). Adults and half-grown birds were plentiful in the sand dune region just north of Morro Rock, but absent in the marshy area about the mouth of Morro Creek; at the town of Morro they were seen busily picking up scraps about the wharves and the huts of the fishermen, who are well acquainted with the bird; both adults and half-grown young were further abundantly observed on the sage covered plain skirting the east shore of Morro Bay, north of the marshy mouth of Los Osos Creek; they were not found on the adjacent hill-slopes (June 6-9).

The record-stations given in the preceding paragraph are in San Luis Obispo County. From the same county Willett¹ has published a note on this form. He wrote: "The commonest of the smaller land birds was the Nuttall Sparrow (*Zonotrichia leucophrys nuttalli*) which was breeding abundantly in the low brush from the water's edge to a mile or more back into the hills and canyons" (near Port Hartford). The writer observed the species in the same locality but did not find it in the hills (May 23-29). It was

¹ Condor, 11, 1909, p. 185.

apparently breeding along the edge of the cliffs between Port Hartford and Pismo (May 24). Both adults and half-grown were common at Oceano in the sandy regions, among the "forests" of blue lupine which attain here a height of 6 to 8 feet (June 11-12).

The hilly coast line about Point Sal (June 14-17) cuts in two the range of this bird, which appears again in the sand dunes a few miles further south, near the station Casmalia, Santa Barbara County (June 14). At Surf (Lompoc Junction), this sparrow is very common in the sand dunes and along the tracks of the railroad (June 18, 22); it is also common at Arguello station near Point Arguello where young with rectrices but half developed were seen (June 19-21); they are absent in such places as the high cliff "Espada" near Sudden.

About Point Conception *Z. l. nuttalli* is the commonest bird on the terrace between the hills and the wave swept cliffs; among those seen were a number of young of the year (July 13-17).

Just around Point Conception, the rolling hills, rising from the shore line to the mountains, form the terminal barrier to the distribution of the species. A single summer record has been published, based on observations made farther to the east or south. Bowles¹ noted two pairs near Santa Barbara: "One pair was feeding some bob-tailed young, evidently newly out of the nest, while the second pair showed every evidence of having a nest, though we failed to locate it." Had Mr. Bowles been near Point Conception, only forty miles east, he could have found not only two, but a hundred or more pairs. The writer spent a whole day (July 8) searching the various types of habitat between the shore and the foothills near Santa Barbara, and failed to find a single individual of the species. Its absence was still more striking along the coast near Goleta, for here its favorite breeding grounds, sandy soil overgrown with sage, and some (rather low) blue lupines, were wholly unfrequented by the sparrow, although scarcely more than thirty miles away it was abundant. Similar observations were made at numerous other points along the entire Channel coast south to middle Ventura County (June 23-July 12).

¹ Auk, 28, 1911, p. 174 (the only definite record the writer has found, based on observations south of Port Hartford, San Luis Obispo County).

SUMMARY AND CONCLUSION.—One may stand on Point Conception with Nuttall's Sparrows hopping about almost at his feet and look eastward along the Channel shore which harbors only rare stragglers of that bird; he may then turn northwest toward the splendid coast line which curves out to the headland of Point Arguello and see other abundantly populated habitats of the subspecies. Such sights impress one with the reality of the problems of distribution.

Zonotrichia leucophrys nuttalli, as its relatively dark colors and small size indicate, is an inhabitant of the humid coast in California. Many subspecies of birds with these common characters, as is well known, are confined to this belt. These other birds, however, have a range less restricted *transversely*, because they dwell in the forests¹ covering the coastwise hills and mountains, but more restricted *longitudinally*, for these forests of the coast area of the transition zone extend southward only to Cambria, the "City of the Pines" in northern San Louis Obispo County. Nuttall's Sparrow, on the other hand, shuns the forest and dwells along the wind-swept coast, nesting near the ground in low plants. It is usually commonest in sandy regions, and is closely associated with certain plants, particularly the large lupines and the sage-brush. In certain canyons the Sparrow is recorded as ranging inland during the breeding season as far as two or three miles, but we did not find it so far back; elsewhere it is confined to the coast line — the sand dunes and the first terrace above the cliffs — seldom occurring as far inland as a mile, and seldom higher than about three hundred feet above the sea. In brief, the distribution of *Z. l. nuttalli* in California may be regarded as practically linear.² It does not inhabit the hillsides, and its range is divided at many points where the waves cut directly into the hills. It also shuns all marshy ground, and is replaced here by Song Sparrows (*Melospiza melodia*, subsp.), the distribution of the two being notably complementary.

Though its range is restricted so closely, *Z. l. nuttalli* is uniformly the dominant bird in its particular habitat during its breeding

¹The marsh-inhabiting land birds, such as the Song Sparrows, have also notably narrow ranges, but their nearest relatives, unlike those of Nuttall's Sparrow, are found in the adjacent highlands.

² In Washington, Nuttall's Sparrow has a much wider breeding range than in California.

season, at least along the California coast south of San Francisco. The species continues abundant along the coast south to Point Conception, where its range ends almost as abruptly as though this promontory were the 'Land's End' of California, instead of a sharp angle in a continued coast line.

The cause of this sudden termination of the distribution of Nuttall's Sparrow is not hard to postulate, when we recall that this subspecies has the characters of birds frequenting humid regions. The outer coast of California is swept by moisture laden winds, causing fogs to form continually during the summer on the hills. These winds blow hard across Point Conception almost uninterruptedly during the spring and summer months, but cease just around the Point, where the famously sunny climate of Santa Barbara is encountered, and there the range of *Zonotrichia l. nuttalli* is abruptly terminated.

THE LIMICOLÆ OF THE STATE OF WASHINGTON.

BY J. H. BOWLES.

APOLOGIES are seldom in good order when presenting a subject for scientific consideration, but the writer of this paper feels that something of the kind is necessary, perhaps, to justify him for offering the following more or less fragmentary notes. However, this most interesting family of birds has, of necessity, received so little attention in this northwestern corner of the United States that what little has been obtained may seem worthy of placing on record.

For one reason or another it has seemed best to omit practically all of the older records, the data here given being made up from either the personal observations of the writer, or from specimens concerning which he feels absolutely positive. Unless otherwise specified, all of these notes come from the west, or ocean side, of the Cascade Mountains, the counties of Chehalis, Clallam, Jefferson, and Pacific bordering on the Pacific Ocean itself. Tacoma, in

Pierce County, is situated on Commencement Bay, which is the beginning of Puget Sound farthest inland, while Seattle, in King County, is some thirty miles farther down the Sound. Dungeness is in Clallam, Gray's Harbor and Westport in Chehalis, with Willapa Harbor in Pacific County. East of the mountains is Kiona, in Benton County, and Brook Lake and Moses Lake in Douglas County, all three locations being of a sagebrush and alkaline character.

It will be of interest to state that the year 1913 was remarkable for the immense flight of shorebirds, both spring and fall, while in 1915 there were practically none at all.

I am greatly indebted to Mr. Carl Lien for all of the notes from Jefferson County and Westport. And also to Messrs. D. E. Brown, of Seattle, Ray Gamble, of Tacoma, G. G. Cantwell, of Puyallup, and F. R. Decker, of Kiona.

Phalaropus fulicarius. RED PHALAROPE.—One specimen taken by Mr. Clark P. Streator at Ilwaco, November 9, 1889. Mr. Carl Lien obtained a second specimen that killed itself by striking the light of the Destruction Island lighthouse, in Jefferson County, on May 8, 1916. These two, representing both spring and fall, are oddly enough the only records that I have for the state.

Lobipes lobatus. NORTHERN PHALAROPE.—A common fall migrant on Puget Sound. My earliest record is a flock of about fifty on July 8, 1900, that were swimming in the tide-rips off Point Defiance, a part of the city of Tacoma. It seemed a trifle out of place to see them feeding where the water is about 200 feet deep, so that their habit of "whirling" for food could not have been very productive of results. The latest specimen taken was by Mr. D. E. Brown at the Tacoma tideflats on August 19, 1913, though large flocks have been reported as late as early September. Mr. Lien reports, for spring records, numerous specimens that killed themselves on the Destruction Island light from April 27 to June 10, 1916, inclusive of both dates.

Steganopus tricolor. WILSON'S PHALAROPE.—Not rare as a summer resident on the borders of the alkaline lakes on the east side of the Cascades. The nest has, I think, never been found in the state, but it has been perfectly evident to myself and other observers that they must breed. No westside records.

Recurvirostra americana. AVOCET.—Formerly this handsome wader was doubtless a common breeder on the alkaline lakes east of the Cascades, but lack of adequate protection has almost exterminated them. Mr. W. Leon Dawson and myself found a small colony breeding at Moses Lake

on May 15, 1906. The only record for the west side is a single bird seen by Cantwell on June 2, 1916, at Dungeness.

Gallinago delicata. WILSON'S SNIPE.—Summer resident east of the Cascades, where it undoubtedly breeds. In the vicinity of Tacoma they arrive with great regularity during the second week of September, from which time they may be found in varying numbers until late in May, although it is my opinion that they do not nest.

Cold weather does not seem to bother them much. On January 1, 1916, when all the fresh water marshes were frozen over, large numbers of them gathered on the Tacoma Flats. In a fresh water marsh, where a running stream kept itself free from ice for its width of some ten feet, I watched a snipe hunting for food. When it reached the stream I was considerably surprised to see it enter the water without the least hesitation. It made good speed in the swim across, holding its head close to its chest, with about an inch of the tip of the bill under water. Thinking the bird must be wounded I was again surprised to see it, after a search of the opposite bank, take wing and fly with all characteristic agility.

Macrohamphus griseus scolopaceus. LONG-BILLED DOWITCHER.—Common during migrations west of the mountains, but less numerous in spring. Earliest fall record is July 13, 1913. Latest, September 31, 1917. Both records are from the Tacoma Flats. On May 11, 1913, Mr. Ray Gamble found them in small numbers at Willapa Harbor, where they were still present on May 18. No eastside records.

Tringa canutus. KNOT.—This species is probably a regular spring and fall migrant west of the mountains, and it seems likely that at least a few may winter. Mr. Lien gives the earliest fall record as August 21, 1917, when he saw a single bird in company with a flock of Black Turnstones and four Wandering Tattlers. Knots were still present up to October 26, when he sent in his notes for this paper. Mr. Cantwell saw a Knot at Dungeness on February 25, 1915.

During the spring migration they are at times extremely numerous. This was especially noticeable during the spring of 1913, when Gamble visited the flats at Willapa Harbor. Mr. Gamble's first notes in that section were made on May 11, 1913, at which time he found the Knots literally in thousands, bringing home an amply sufficient number in proof of his statement. On May 18 at the same place they were becoming scarcer, but were still in considerable numbers. Mr. D. E. Brown visited the same locality on May 16, 1914, and found them to be again fairly numerous. Mr. Lien records them on May 6, 1916.

Arquatella maritima couesi. ALEUTIAN SANDPIPER.—Records for this sandpiper in the state are comparatively rare, though it seems not unlikely that the birds may occur more often than is generally supposed. Personally, I have never seen the species alive, but Cantwell, who has taken specimens, writes me concerning them as follows:—“The Aleutian Sandpipers about which you enquire were noted at Dungeness from the 10th to the 18th of March, 1916, both on the Lighthouse Spit reservation and

on the tide flats opposite town. There were about twenty individuals, in small bunches of three to six, associated with other sandpipers. When flushed they invariably travelled together. In the middle of February the year previous there were none of these birds about at this point, nor on November 22 to 28 of 1916. Lien records another specimen, a male, collected in Jefferson County on the ocean shore on January 8, 1917.

Pisobia maculata. PECTORAL SANDPIPER.—A tolerably regular and sometimes common fall migrant to the tideflats and freshwater marshes in the vicinity of Tacoma. I have no spring records. The earliest record is of one taken August 30, 1913, the latest one taken September 29, 1896. I have never seen them associating with the other sandpipers, always seeming to keep by themselves, but I have several times flushed this species and the Wilson's Snipe only a few feet apart in the same marsh. However, I am inclined to think that this was accident rather than design of the birds.

Pisobia bairdi. BAIRD'S SANDPIPER.—The only records that I have for this species were made by Mr. Stanton Warburton, Jr., and myself during the fall of 1916 on the Tacoma Flats. The first specimen taken was a female on July 26, from which date they were to be found at almost any time up to September 5, when the last was collected. They were found in singles, pairs, or trios, most often associating with the Semipalmated Plover (*Ægialitis semipalmata*) when any were to be found. When flying with a company of the other small sandpipers they would separate as soon as the flock alighted to feed, the Baird's going to comparatively dry ground for their food while the others waded about in the water and at the water's edge. They could not have been called common, but from one to three or four were to be found on almost any day.

Pisobia minutilla. LEAST SANDPIPER.—Although possibly not as abundant in the aggregate as the Western Sandpipers this tiny bird is the most often and most regularly found of all the Limicolæ. They make their first appearance during the first week of July, remaining well on towards the latter part of September. I have collected only a few of them, as it seemed a useless waste of life to take many specimens. Their tameness makes close approach to within a few feet easy, when their yellow-green legs at once distinguish them from the black-legged Western Sandpipers, the only species with which they can be confused. Earliest spring record, April 29, 1917, on the Tacoma Flats by S. Warburton, Jr.

Pelidna alpina sakhalina. RED-BACKED SANDPIPER.—These birds are among the last of the Limicolæ to arrive in the fall migration, often reaching Washington after many of the other species have left for the south. They make up for it, however, by staying with us all winter and late into the spring. On the Nisqually Flats I have seen them in flocks of hundreds when the marsh was a solid pack of snow and ice, the rise and fall of the tide making sufficient feeding grounds to keep them fat and strong. The earliest record, September 26, the latest being Mr. Gamble's remarkable shore-bird flight of May 11, 1913, when they were plentiful.

Ereunetes mauri. WESTERN SANDPIPER.—In total numbers this

species is probably the most abundant of all our Limicolæ, coming a few days after the Least Sandpipers and leaving, as a rule, a few days earlier. They are spring and fall migrants, the only exception being a specimen that I took on the Nisqually Flats on November 25, 1916. This was a female and very fat, in spite of the cold season. The primaries in one wing were not quite grown to full length, which may account for the delayed migration, but it was quite able to hold its own with a few Killdeer that were flying along with it.

Calidris leucophaea. SANDERLING.—The Sanderling is one of several species concerning which we have very little accurate data. They cannot be frequent visitors to upper Puget Sound, as I have no records. Cantwell reports them as abundant winter residents at Dungeness, his earliest arrivals being on August 18, 1916. He saw 200 on February 25, 1915, and also noted them between December 30, 1915, and January 16, 1916.

Limosa fedoa. MARBLED GODWIT.—We have but one record for this fine wader, the specimen being shot on the Tacoma Flats on September 3, 1905, by Mr. T. C. Harmer, of Tacoma. This was secured from a flock of about fifteen large waders of a similar size, but in California I have found these godwits so often in the same vicinity with Hudsonian Curlew that possibly the flock in question may have been composed of both of these species.

Totanus melanoleucus. GREATER YELLOW-LEGS.—While this bird is never actually common, it is probably more often seen than any of the other large waders, one or two generally greeting us upon every visit to the flats during spring and fall. It is among the first to reach us from the north in the fall migration, Brown taking one on the Tacoma Flats on July 4, 1914. They remain with us late into the season and are, to some extent, winter residents, as Cantwell reports them at Dungeness between December 30 and January 16, 1916. Latest spring record by Brown, is May 16, 1914, at Willapa Harbor.

Totanus flavipes. YELLOW-LEGS.—Seen during the fall of 1913, when they were by no means rare, twice in 1915, and one on May 23, 1918. When not alone they were most often found in company with Long-billed Dowitchers. On August 16, 1913, a flock of forty-eight were seen on the Tacoma Flats by Mr. Brown, who collected specimens. The writer was so fortunate as to take the first recorded, an adult male on July 25, 1913, and the earliest was seen July 7, 1915, at Tacoma. Brown saw one on August 7, 1915, at Seattle.

Helodromas solitarius cinnamomeus. WESTERN SOLITARY SAND-PIPER.—A very rare fall migrant, and still more so in the spring. We have but four records in all, the first being one bird seen by myself August 22, 1912, on the Nisqually Flats. While this bird was not actually collected, it was very tame and I watched it from a distance of only a few feet for some time. I am so well acquainted with these birds in other parts of the country that there was no possibility of a mistake. Mr. Brown collected another at Seattle on August 6, 1915, while Mr. F. R. Decker took one at

Kiona, in eastern Washington, on August 6, 1916. Both these birds were females. The only spring records are a very fine male that was taken by Mr. Brown at South Tacoma on May 6, 1914, and three that he saw at the same place on the 7th.

Catoptrophorus semipalmatus inornatus. WESTERN WILLET.— I have heard of one or two that have been shot on the coast, but the only specimen that I have seen is a female taken by Mr. Brown on the Tacoma Flats, September 6, 1913. It was alone, not being in company with any other shorebirds.

Heteractitis incanus. WANDERING TATLER.— We do not know much about this species. Mr. Lien's earliest record is of four seen August 21, in company with one Knot and a flock of Black Turnstones. His latest record is September 8, and six is the greatest number he has ever seen at one time. All of these records were made in 1917.

Tryngites subruficollis. BUFF-BREASTED SANDPIPER.— The only records of these birds that I have for the state are of a male and female taken by Mr. Lien at Westport, on September 3, 1917. He first saw the pair on September 1, and again on the 2d, visiting the place with a gun on the 3d and collecting them. Mr. Lien describes them as not at all wild, and that, "They frequented a salt marsh, or grass covered tide flat, towards the upper end and where the marsh edges off into the sand."

Actitis macularia. SPOTTED SANDPIPER.— These birds are summer residents throughout the state and breed, although nowhere to be found in abundance. I am uncertain of the conditions east of the Cascades, but in the vicinity of Puget Sound they are resident throughout the year, being found on the tideflats even in the coldest winters.

Numenius americanus. LONG-BILLED CURLEW.— Civilization is working the inevitable with these birds. At one time they were doubtless common summer residents of eastern Washington, but my only record for the state in recent years is of a pair that I found at Kiona, in Benton County, during the second week of May, 1904. At this time they had newly hatched young, concerning which they were most solicitous, hovering only ten or fifteen feet above my head and whistling continuously.

Numenius hudsonicus. HUDSONIAN CURLEW.— A regular and very abundant spring migrant, usually arriving with great regularity on April 22, which is my earliest record. Latest spring record June 2, 1916. The only season when I have positively known it to visit us in the fall is during the present year of 1917, when they were very abundant. The first seen was a male that I collected on July 16, the last being shot on October 1. The record made on June 2, 1916, was at Dungeness where Cantwell saw about fifty in scattered flocks.

Squatarola squatarola. BLACK-BELLIED PLOVER.— A common fall and spring migrant. I have no reports of them from the east side. Latest spring record May 18, 1913. Earliest fall record August 20, 1916. They are doubtless winter residents, as Cantwell saw twenty-five at Dungeness on January 24, 1916.

Charadrius dominicus dominicus. GOLDEN PLOVER.—It seems more than possible that the Golden Plover are more numerous along the coast than is generally supposed, although doubtless very far from being common. I have only two records in which the dates and other items are perfectly satisfactory. The first is a female taken at Dungeness on November 14, 1915, by Mr. F. P. McIntyre, of Tacoma. The second was taken by Mr. Lien at Westport on October 7, 1917. It was in the company of four other plover, which may have all been Black-bellied as was one of them that dropped with the same shot that killed the Golden Plover.

Oxyechus vociferus. KILLDEER.—Very abundant throughout the state, though I am not certain whether it winters on the east side. West of the mountains, in the Puget Sound Region, the Killdeer may be called a fairly common resident the year around, although probably a considerable proportion of them migrate southward in the fall. However this may be, they are to be found regularly during the winter on such of the large tide flats as the Nisqually, in Thurston County. Their numbers at this season are largely dependent upon the extent to which the inland fresh water swamps and marshes are frozen over. In January, 1916, one of the longest spells of icy weather was experienced that has ever been known on Puget Sound, during which practically all fresh water was frozen over. During this period the Killdeer assembled in hundreds on the Nisqually, and also on the Tacoma Flats in Pierce County.

Nesting begins very early, as I have seen young a week old as early as April 21, and extends well into June at least.

Ægialitis semipalmata. SEMIPALMATED PLOVER.—A regular spring and fall migrant. Never abundant, but frequently seen in twos and threes, either by themselves or in company with some of the smaller sandpipers. Earliest fall record: two taken on the Tacoma Flats on August 8, 1916. Latest spring record: two taken by Cantwell near Tacoma on May 18, 1910.

Ægialitis nivosa. SNOWY PLOVER.—Brown found these birds at Willapa Harbor on May 16, 1914. There appeared to be a small colony of them, and a few specimens taken showed beyond a doubt that they were breeding at that time, although no nests were found.

Aphriza virgata. SURF-BIRD.—These birds are probably not uncommon along the coast as migrants and would appear to be resident in winter to some extent, as shown by the observations of Mr. Lien. Specimens were taken by him on the following dates:—July 20, 1915, November 27, 1916, December 3, 1916, January 14, 1917, and April 28, 1917. The first specimens recorded were by Dr. A. K. Fisher, who took three from a small flock at the Blakeley Rocks, near Seattle, on August 30, 1897. However, it seems to me unlikely that they would be of frequent occurrence so far inland.

Arenaria interpres morinella. RUDDY TURNSTONE.—Mr. Gamble found this species present in small numbers on his visit to Willapa Harbor on May 11, 1913, when he collected a few specimens. They were still

present in that locality on May 18, 1913, when two more specimens were taken. Mr. Brown saw two at the same place on May 16, 1914, although circumstances prevented his collecting any.

***Arenaria melanocephala*.** BLACK TURNSTONE.—Migratory, for the most part along the coast, although Mr. Brown shot a pair at Tacoma on August 24, 1913, that were sitting on a raft of logs out in the bay. Mr. Cantwell reports them as winter residents at Dungeness, where his records range from August 18, December 30, January 16, to February 25.

Mr. Lien reports twenty as being the greatest number that he has seen at one time.

***Hæmatopus bachmani*.** BLACK OYSTER-CATCHER.—Without doubt resident throughout the year, although specific records for every winter month are lacking. Mr. Lien has taken them in November and on December 22, 1916. They breed fairly commonly on the rocky islands off the coast, fresh eggs being taken throughout the month of June. Three eggs is the number most commonly found. The nest is placed among the rocks fifteen feet or more beyond the reach of high water, and is composed of small stones, chips of rock, with a few small pieces of crab claws and shell.

THE BIRDS OF DESECHEO ISLAND, PORTO RICO.

BY ALEXANDER WETMORE.

THE island of Desecheo, west of Porto Rico, in Mona Passage, is distant nearly seven leagues from the town of Aguadilla. Though Desecheo has been a prominent landmark for ships passing between Porto Rico and Santo Domingo since the early voyages of discovery, its rough broken shoreline, with difficult landings and lack of a certain water supply, have left it little known. Fray Iñigo Abbad in 1788¹ describes the island as uninhabited but frequented at times by smugglers. It was said that there were wild goats on it at one time which, with crabs and shellfish, furnished food to these casual visitors. The banks off the southern shore have been noted for their fish, and fishermen coming at irregular intervals

¹ (Abbad y Lasierra, Fray Iñigo) *Historia geográfica, civil y política, de la Isla de S. Juan Bautista de Puerto Rico*, Madrid, 1788, p. 203.

from Porto Rico established temporary camps on the island where they lived for short periods and salted their catches.

Gundlach passing north of Desecheo in 1874 remarked on the abundance of waterfowl around it but did not visit it during his work in Porto Rico. Bowdish crossed from Aguadilla on June 24, 1900, and returned on the same day. He came again the following year and remained from July 6 to 10. All that was known of the bird life of the island prior to 1912 is embodied in his notes.

During my stay in Aguadilla in June, 1912, I made many inquiries concerning Desecheo and finally arranged to visit the island. With two fishermen, Juan and Pedro, who were familiar with Desecheo, I left Aguadilla on June 13 in a small open sailboat. We reached the island about five that night and after some difficulty made a landing in a small sandy indentation in the cliffs. We camped on the beach while a small cave served as a work room and shelter from the intense heat of the sun. We worked here until June 16, when we returned to Aguadilla as a storm was brewing and our water supply was low.

In December, 1912, Desecheo Island was made a bird reserve, a wise regulation, as sooner or later charcoal burners in search of wood would have visited it and destroyed the shrubs that now support and shelter part of the sea bird rookeries.

PHYSICAL FEATURES.

Desecheo Island is about one and one-fourth miles long by somewhat more than three-fourths of a mile broad. The island is rounded in general form with points projecting at the eastern and western ends. Inland the slopes rise steeply to a double pointed hill, the higher part of which is six hundred feet above sea level. The shore line is rocky and abrupt. In three places there are small bays with sandy beaches, back of which rise cliffs from thirty to fifty feet high. An ill-defined path leads around three sides of the island, but the eastern end is difficult of access. Strong currents sweep past, the surf is usually heavy, and there are rocks offshore in the little bays so that landings are made with difficulty.

The soil is thin and rocky but above tidemark the island is cov-

ered with vegetation. The core of the island is made up of volcanic rock upon which are deposits of limestone. Along the shore this limerock is eaten and eroded by wave action and shallow caves are found in several places.

The island was very dry, with no springs or watercourses. I was told that heavy rains fell at irregular intervals, and small basins in the rock had been dammed to catch rainwater. The sun was intensely hot during my stay, but the nights were cool and pleasant.

GENERAL CONDITIONS.

The vegetation somewhat resembled that of wooded hills on Culebra Island. The short-stemmed, heavy-limbed West Indian Birch (*Elaphrium simaruba*) grew on the hill slopes mingled with the Palo de Burro (*Capparis cynophallophora*). Near the shore the Té de la Playa (*Corchorus hirsutus*) was common; the Bejuco de Paralejo (*Stigmaphyllon lingulatum*) grew everywhere. There were great beds of *Opuntia* along the cliffs, *Cereus* was abundant, and a large branched cactus formed dense thickets. Small openings in the brush were grown with *Panicum utowanæum* and *Valota insularis*. These grass-grown openings were few in number and small in extent. Cacti and thorny creepers, that bound the shrubs together, made a dense jungle through which progress was difficult, so that it was necessary to stay in the trail skirting the shore or make a new one with the machete.

I noticed many signs of rodents in the grass and under the bushes and one evening after sunset found rats abundant and very tame while taking a walk beyond the rookeries above camp. Three that I shot with an automatic pistol were *Rattus rattus*, and as nearly as I could tell in the dim light all were of this small species. They were feeding on the seeds of low plants and tender herbage. A few bats were seen but under conditions that did not allow identification. I saw no trace of the wild goats that were said to range here at one time. From the dense growth of vegetation I judged that they had disappeared many years before.

The curious Siguana (*Ameiva* sp.) a terrestrial lizard, was found in sandy localities and was fairly common. One that lived near

my camp was more or less of a scavenger and ate bits of meat left on the fish bones that I threw out. An *Anolis* intermediate in its characters between *Anolis cristatellus* of Porto Rico and *A. monensis* of Mona Island was abundant and several specimens were preserved.

BIRD LIFE.

In his account of the birds of Porto Rico, Mr. Bowdish (1902-03) gives eight species found on Desecheo Island. I have added three more to this number, raising the known list to eleven species. One of the additions, the Scaled Pigeon, is included on the authority of the fishermen who were with me. The larger part of the species found here are forms that breed habitually on similar small isolated islands. These are the Boobies, Terns and Man-o'-War Birds. Among others, the Zenaida Dove is apparently resident. Only one passerine bird was found, the Pearly-eyed Thrasher, a species that in Porto Rico is very rare on the main island but is abundant on the small islands around it. The absence of *Careba portoricensis* is notable as this species is widespread in its occurrence. During the winter season it is probable that a number of migrant land and water birds stop here for short periods, and it is to these transients that we must look for other additions to the avifauna of the island. Bowdish (1900, p. 120) on his first visit says that he thought he heard the note of *Vircosylva calidris* but was uncertain. The "Sooty Tern" that he records (1900, p. 119) is *Anous stolidus*, and not *Sterna fuscata*.

BIBLIOGRAPHY.

There are three papers that make direct reference to the birds of Desecheo Island. Stahl and Gundlach both mention species that were reported to occur on this island but neither of these authors makes definite statements concerning its avifauna. The papers mentioned follow:

BOWDISH, B. S.

1900. A Day on De Cicheo Island, *Oölogist*, 1900, pp. 117-120.

1902-03. Birds of Porto Rico. *Auk*, 1902, pp. 356-366, and 1903, pp. 10-23.

WETMORE, A.

1916. Birds of Porto Rico, U. S. Dept. Agric. Bull. 326, 1916, pp. 1-140, 10 plates (including map).

ANNOTATED LIST.

1. **Phaëthon** sp. TROPIC BIRD.—Bowdish (1902-3, p. 358) saw Tropic-Birds around Desecheo Island but did not determine to what species they belonged. These birds may have been *Phaëthon americanus* Grant as that is the common species of this region. (Cf. Wetmore, 1916, p. 18).

2. **Sula piscator** (Linnaeus). RED-FOOTED BOOBY.—About two thousand Red-footed Boobies were present on the island at the time of my visit. All were in one colony. (Wetmore, 1916, pp. 18-19).

3. **Sula leucogastra** (Boddaert). BOOBY.—The Common Booby outnumbered any other species of bird on Desecheo Island at the time of my visit. These Boobies were distributed through the dense brush on the slopes so that it was difficult to arrive at their exact number, but I estimated that from 8,000 to 10,000 individuals were present. The greater part of these birds remained within four hundred feet of the shore, but many spread inland over the entire island ranging to the tops of the hills. The young were all grown, though I saw a few with down feathers clinging to the feathers about the head. Though as strong on the wing as their parents, these immature birds were averse to flying and usually merely scrambled out of the way. The adults were unable to rise from a level surface, and as I passed along the narrow trails many remained stock still snapping and hissing at me. It was wise to avoid their powerful bills as they bit and fought viciously. They flew easily from the branches of low trees and bushes or sailed down from the cliffs until, gaining momentum, they rose with strong wing beats. On the whole they showed little fear and I caught several by pinning them down with the barrel of my gun. Others floundered away over the rocks and through the plant growth unmindful of cactus thorns and the rough limestone. Many were seen with thorns or even small lobes of cactus hanging to feet, neck or wings, easily demonstrating how these prickly plants might be carried from one island to another.

On the wing Boobies were strong and graceful. Hundreds swung and circled about my head as I passed through the colonies. Collecting them was an easy matter. It was necessary only to pick out one desirable for a specimen, follow it until it was at a proper distance, and then drop it on the rocks. At a gunshot there was a great rush and commotion among those at rest and the air was filled with birds circling and sailing, that often passed close overhead. Gradually the confusion would cease and the birds would soon be perched all about me. On the rough limestone blocks above the sea they sat in rows and did not drop off until I approached closely. The call-note of the Booby was a loud *quack, quack, quack*. I saw them fishing far out at sea from the island and birds passed in and out above my camp all through the day. Even at night there was much commotion among them.

Boobies are said to nest from late in June until October. From the size of many young seen in June I would extend the latter date to February. It

was said that eggging parties visited Desecheo at times but the currents and the rocky shoreline make landing difficult and laborious so that the birds are not often disturbed.

4. **Fregata magnificens** Matthews. MAN-O'-WAR-BIRD.—About 175 pairs nested on Desecheo Island in 1912 and all had well grown young at the time of my visit. A pair of adults was collected on June 15. The female fell into the sea when shot and floated for some time with the bill submerged. On skinning this bird I found the air-sacs between skin and body filled with water.

5. **Hæmatopus palliatus** (Temminck). OYSTER-CATCHER.—Three Oyster-catchers were found June 14 on flat rocks washed by the waves. Although other birds of this uninhabited island were very tame the Oyster-catchers were wary. When I came in sight they flew to some outlying inaccessible rocks and repeated this performance whenever I appeared. The whistle was louder and sharper than that of *H. bachmani* with whose notes I had been familiar in the Aleutian Islands. Others were seen on the following day but none were taken. Mr. Bowdish (1902-03, p. 360) noted this species.

6. **Larus atricilla atricilla** Linnæus. LAUGHING GULL.—About thirty Laughing Gulls were seen on Desecheo but no nests were found. These Gulls worked along the beaches hunting for food or perched on boulders commanding an outlook of the water line. An adult was collected June 14.

7. **Anous stolidus stolidus** (Linnæus). NODDY.—The Noddy was abundant on Desecheo and was breeding in the limestone ledges near the sea. At the time of my visit there were about two thousand here while many more were feeding a few miles offshore. On the cliffs above camp was a colony of two hundred, that was never quiet day or night. Many had not picked their nesting sites as yet and were examining the ledges, quarreling with the birds already settled and in turn getting their tail feathers tweaked sharply. When alarmed the Noddies flew all about me, calling harshly and there was great excitement among them at every intrusion. Some would leave their nests and dart fiercely at my head while others remained on their eggs until I was almost within reach. These terns were more or less active all night long, flying about and calling loudly. The common call note was a harsh *Kar-r-rk* and a scolding note resembled *Kwok Kwok*. In feeding the birds hovered over the water, darting quickly down, poising an instant while picking something from the surface and then rising again. Eggs taken ranged in incubation from fresh to well incubated. No young were found. Birds were collected for skins on June 13, 14 and 15. Mr. Bowdish (1902-03, p. 358) found a few well grown young on June 24, 1900.

8. **Sterna anætheta** Scopoli. BRIDLED TERN.—A common breeding bird. I estimated that there were about 1500 of these terns on Desecheo Island. Many were gathered on some large rocks lying offshore that I could not reach, while others frequented the limestone cliffs and huge

boulders on the main island. At a gunshot all those near would rise and circle with the other birds. On the wing these terns were swift and graceful. Frequently half a dozen would dart out together over the water and then circle back more slowly. Males were seen standing on the rocks above the females on their nests and as I approached swooped at my head with angry cries. The nests examined were in hollows on the tops or sides of huge blocks of limestone in situations protected from the blazing rays of the sun. Some were placed in holes eaten into the rocks by the action of the water. The nests were made of a few loose pebbles and bits of loose limestone gathered together with perhaps a feather or two added. Two eggs collected were badly incubated. No young were observed. Apparently the breeding season varies from year to year as Mr. Bowdish (1902-03, p. 357-358) found fresh eggs on June 24, 1900, and notes an egg advanced in incubation taken July 6, 1901. I collected four males and one female on June 14.

9. ***Zenaida zenaida lucida*** Noble. PORTO RICAN DOVE.—This Zenaida Dove was common in the growths of West Indian birch and other shrubbery that covered the arid slopes of Desecheo Island. The males called all day long, but in the thorny growths it was difficult to approach them. I found scattered birds feeding in small openings or along the trails. At low tide these doves were seen frequently about pools of salt water left by the receding tide on the rough limestone of the shore. As there was no fresh water on the island it was a question in my mind as to whether or not they were drinking this sea water.

Lowe¹ remarks that *Patagïænas leucocephala* is said to cross from Swan Island to Honduras, a distance of ninety-eight miles, to secure water in times of drought. I saw no indication, however, that these Zenaida Doves left Desecheo for this purpose.

10. ***Patagïænas squamosa*** (Bonnaterre). SCALED PIGEON.—On June 15, the fishermen who were with me reported seeing several Scaled Pigeons. There seems to be some migration among these large pigeons, as at some seasons they are said to be fairly common here.

11. ***Margarops fuscatus fuscatus*** (Vieillot). PEARLY-EYED THRASHER.—These thrashers, the only passerine birds noted, were common on Desecheo Island. In the dense brush it was difficult to locate them though their call-notes were often heard. The fishermen who visit the island occasionally had dammed a hollow in the rocks to catch rain water, and Thrashers came often to this tiny pool. There was no other fresh water on the island so that the birds must do without in dry seasons. A pair of Pearly-eyed Thrashers had their nest in the roof of a small cave which served me as a shelter from the sun while making up skins. This nest apparently was a bulky structure as grass and twigs projected from all the openings leading into the crevice in which it was located. The female was incubating. Both birds perched about on the rock shelves without fear

¹ A Naturalist on Desert Islands, London, 1911, p. 46.

of me. They fought continually with the Noddies that were nesting there and though the terns were the aggressors in most cases, they were always worsted in the encounters. The male sang in the evenings from a cactus just above the cave entrance, frequently calling until it was almost dark.

SOME RECENT CONNECTICUT BIRD NOTES.

BY ARETAS A. SAUNDERS.

THE following notes are based on my observations in the past four years in Connecticut and relate to occurrences that are unusual and especially interesting.

Uria lomvia lomvia. BRÜNNICH'S MURRE.—Four seen closely at Norwalk, December 31, 1916.

Larus delawarensis. RING-BILLED GULL.—Three of these gulls were seen January 27, 1917, in Norwalk Harbor. They were feeding near one of the drawbridges in company with Herring Gulls. The gulls here have been fed by people until they have become exceedingly tame. These birds were watched for a long time in the best of light. The markings on the bill and on the tips of the primaries that distinguish the species were quite plain. The difference in size was less apparent than I had expected it to be. One or two gulls of this species were seen in this same spot several times in the month of February.

Larus atricilla. LAUGHING GULL.—This species is now becoming almost common along the Connecticut shore. Others have informed me of its presence since 1914. I first noted it at Grove Beach September 1, 1916, and have since noted it several times in summer, both at Grove Beach and at Compo Cove near Westport.

Phalacrocorax auritus auritus. DOUBLE-CRESTED CORMORANT.—A flock of forty-five seen at Grove Beach May 27, 1916, and another, of seventy-four, seen at the mouth of the Saugatuck River, May 19, 1917.

Mareca americana. BALDPATE.—A rather late date for this species was that of a single drake seen on a small pond at Norwalk on the morning of March 31 and again on April 1, 1917.

Charitonetta albeola. BUFFLEHEAD.—The past winter and spring, 1916 and 1917, this species has been more abundant than I have ever seen it before in Connecticut. I first noted it at Grove Beach, December 25, 1916, when several small flocks were seen. A few were seen all winter at Norwalk and Westport, and larger flocks appeared again in the spring migration from March 10 to April 7.

Ixobrychus exilis. LEAST BITTERN.—Two seen, and one, a male, secured in Great Marsh, near Norwalk, May 19, 1917. This date is rather early for this species.

Ardea herodias herodias. GREAT BLUE HERON.—This species remained later than usual in the spring of 1917, six being seen at the mouth of the Saugatuck on May 26.

Herodias egretta. EGRET.—A single bird has been reported in the marshes at Compo Cove, Westport, every summer since 1912. The bird usually stays for several days. I saw it during the summer of 1916, when it was present from July 24 to 28. It was again reported this summer, 1917.

Pisobia maculata. PECTORAL SANDPIPER.—A single bird seen in marshes at Silver Sands, East Haven, May 13, 1916. This is the only spring record for Connecticut, but the bird was seen closely, and I examined skins in spring plumage shortly after I had seen it, and am sure of my identification.

Oxyechus vociferus. KILLDEER.—This species is evidently increasing, and is now quite common in southwestern Connecticut. I observed a single bird at West Haven, March 21, 1914. I did not see it again till 1916, when a pair were seen several times in a plowed field near Westport. In 1917 the species first appeared on March 31, and was seen commonly throughout the spring and summer. Mr. Wilbur F. Smith found several nests near Norwalk, and I found downy young at Norwalk on May 12.

Arenaria interpres morinella. RUDDY TURNSTONE.—A single bird was seen at Grove Beach September 1, 1916, and four others September 9. Two were seen at the mouth of the Saugatuck River May 19, 1917.

Cathartes aura septentrionalis. TURKEY VULTURE.—One seen at Short Beach, May 23, 1914.

Sphyrapicus varius varius. YELLOW-BELLIED SAPSUCKER.—A bird of this species in juvenal plumage, wintered in Norwalk in January, 1917. I first saw it, January 6 and continued to find it every time I visited the locality till January 27, after which I did not look for it again till March 3, when it was not to be found. The bird frequented a row of Norway Spruce trees, growing about the border of a large estate.

Melanerpes erythrocephalus. RED-HEADED WOODPECKER.—This species was almost common in Edgewood Park, New Haven, in the spring of 1915. I met with it several times between April 16 and May 4, four being seen at once on one occasion. The following year, 1916, a pair nested in a hole in a trolley pole at West Haven, where I saw them on May 13, 19 and 20.

Hesperiphona vespertina vespertina. EVENING GROSBEAK.—A single bird in the female plumage, seen at New Haven, April 15, 1916, and a flock of twelve at Cannondale, April 17, 1917.

Carpodacus purpureus purpureus. PURPLE FINCH.—What was apparently the spring migration of this species began at Norwalk in 1917 on February 20. A few birds had been around all winter, but beginning with that date the birds were plentiful everywhere, singing a great deal, and

visiting various bird feeding stations, where they ate peanuts, buckwheat and sunflower seeds. These birds were abundant from this time all through the spring until May 21 when the last disappeared.

***Loxia leucoptera*.** WHITE-WINGED CROSSBILL.—Seen at Norwalk on various dates from January 13 to March 3, 1917. Never more than two birds were seen at once, but that they were not always the same two was evident from the fact that sometimes both were in female plumage and sometimes one in that of an adult male.

***Calcarius lapponicus lapponicus*.** LAPLAND LONGSPUR.—A single bird seen in salt marshes at Norwalk in company with a flock of Horned Larks, January 20, 1917.

***Poœcetes gramineus gramineus*.** VESPER SPARROW.—A single bird seen at Norwalk March 10, 1917. Whether an extremely early spring migrant or a bird that had wintered it is hard to say. No others were seen until March 31, about the normal time for the arrival of this species.

***Passerculus princeps*.** IPSWICH SPARROW.—One seen at Norwalk April 1, 1916, and another November 11, 1916.

***Zonotrichia leucophrys leucophrys*.** WHITE-CROWNED SPARROW.—May 16 to 18, 1917, a single bird was seen each day in such widely separated localities that it is not probable that they were the same individual. May 19 the species was almost common, but none were seen after that date.

***Junco hyemalis hyemalis*.** SLATE-COLORED JUNCO.—This species remained very late in the spring of 1917. I secured one on May 12 and saw others up to May 17.

***Melospiza lincolni lincolni*.** LINCOLN'S SPARROW.—One seen at West Haven, May 24, 1915, and another in Edgewood Park, New Haven, May 11, 1916.

***Cardinalis cardinalis cardinalis*.** CARDINAL.—A male Cardinal spent the winter of 1916-17 at Norwalk. It was first found by Mr. Geo. P. Ells in November, and from then on became an object of special interest to Norwalk's many bird-lovers and students. I first saw it December 9, 1916, and from then until April 9, 1917, was able to find it whenever I visited the locality it frequented, in the morning. In the afternoon I was not always so successful. It disappeared some time after April 9, and as far as I can tell was last seen by a conductor on a trolley line, which ran past its haunt, on April 11. I searched for it on the 15th and was unable to find it.

Another Cardinal, a female, was seen at Clinton during the Christmas holidays. I first saw it Christmas morning at 7 A.M. when its sharp call-note outside awoke me, and I observed it for a short time in the center of a gravel walk. The following morning and again on the 27th, the bird was seen at 7 o'clock on this gravel walk. I never succeeded in locating it anywhere in the vicinity at any other time of day. I am of the opinion that it spent the nights in a large arbor-vitae tree about 15 feet from the point where it was seen, and that each morning it began its daily program

by picking up a little gravel from the walk. A hard rainstorm occurred on the 27th which evidently interfered with this program, for I did not see it again on the mornings following that date.

Lanivireo solitarius solitarius. BLUE-HEADED VIREO.— This species remained unusually late in the spring of 1917, one being secured on May 15 and others seen until May 24.

Vermivora peregrina. TENNESSEE WARBLER.— This species has greatly increased in numbers in the past few years, until, in 1917, it was one of the most abundant of migrant warblers. I first met with the species at Short Beach, on May 23, and 24, 1914, when a single male was found singing in the same tree, two mornings in succession. In 1915 I met with three adult males in song in the same tree at West Haven, May 20. In 1916 the birds were fairly common in the vicinity of New Haven, from May 20 to 26. In 1917 I first saw the bird May 22, though I think that I heard the song on the 18th. It became common by the 24th, and was seen almost daily, and often in large numbers until June 4. The last bird was seen June 9.

Dendroica tigrina. CAPE MAY WARBLER.— This is another species that has evidently been increasing in recent years. In 1916 it was almost common in Edgewood Park, New Haven, from May 10 to 16. In 1917 it was less common than the previous year, but I saw several specimens at Norwalk and Bridgeport on May 19 and 25.

Dendroica castanea. BAY-BREASTED WARBLER.— This is another warbler that deserves notice as one increasing in numbers. While it never was so rare as the Cape May and Tennessee, yet it always had some reputation for rarity. The past two years, 1916 and 1917, it has been one of the most abundant migrant warblers, particularly late in the season, remaining in Norwalk in 1917 till June 2.

Dendroica discolor. PRAIRIE WARBLER.— An exceptionally late fall bird was one seen at Norwalk on October 22, 1916.

Sitta canadensis. RED-BREASTED NUTHATCH.— A winter record for this species is one that I saw in Norwalk February 24, 1917.

Bæolophus bicolor. TUFTED TITMOUSE.— On March 10, 1917, I found a single bird of this species in a large red maple swamp. I first heard the bird calling from a distance, and being unable to enter the swamp, but suspecting the identity of the bird from previous acquaintance with it in the south, I imitated its whistle and succeeded in bringing it to a point about fifty feet above my head. The bird was observed by several others later, and sometimes from a distance of about ten feet. I found it several times in the latter part of March, and saw it last on April 1 after which it disappeared.

Penthestes hudsonicus subsp.? HUDSONIAN CHICKADEE.— A bird of this species appeared in Norwalk in January 1917, where it remained for some time, feeding on suet that was hung in the bushes for birds. I saw it first on January 13 and again January 27. I presume that, like the others that appeared the same winter, it belonged to the new Labrador sub-

species, but since the subspecies' validity has not yet been determined I have not listed it as such.

Regulus calendula calendula. RUBY-CROWNED KINGLET.— This is another species that remained exceptionally late in the spring of 1917. I observed it up to May 18, securing a specimen on the last date.

NOTES ON THE NESTING BIRDS OF WAHPETON, NORTH DAKOTA.

BY J. K. JENSEN.

THE region covered by the following notes is a small part of Richland County, forming a quarter of a circle with a radius of three miles, west and north of Wahpeton, with the Indian School as a center. The ground covered takes in the North Dakota side of the Red River, where a little timber is to be found. The rest consists mostly of cultivated fields, some prairie and a little swampy or wet ground and a few groves around the farm buildings.

This list includes, with one or two exceptions, only birds I actually found nesting in 1917, and does not profess to be complete.

Botaurus lentiginosus. BITTERN.— Very common as a nesting bird. On June 6 I found a nest in a clover-field less than a thousand feet north of the Indian School. The Bittern would generally leave the nest when I was about ten feet away. The nest consisted of a handful of dry grass, and contained a set of four fresh eggs.

Zenaidura macroura carolinensis. MOURNING DOVE.— Very common. Nests and eggs were found from May 1 to September 1 both in trees and on the ground. Near the Indian School I found a nest, which first served as home for the White-rumped Shrike, later a pair of Brown Thrashers took possession and laid a set of five eggs and a Cowbird placed one of her eggs in the nest. About August 1, I again found the nest occupied, this time by a Mourning Dove incubating two eggs.

Oxyechus vociferus. KILLDEER.— The Killdeer is very common in this part of North Dakota, but I only located one nest. This was placed about a hundred feet west of the Indian School in a little garden plot. The nest was a little hollow in the ground, lined with a few dry weedstalks, and on May 11 it contained four fresh eggs.

Tympanuchus americanus. PRAIRIE HEN.—I only found one nest of this species. On June 3 it contained eleven nearly fresh eggs, and was made of dry grass and a few feathers of the owner. It was quite open and easy to locate.

Circus hudsonius. MARSH HAWK.—Very common and in evidence from morning to night. On prairie land west of the city I found several nests, sometimes only a few hundred feet apart. The nests were quite well made of grass and weeds, generally raised one or two inches above the ground. Most of them contained five eggs. One nest I located on May 27 was raised thirteen inches above the level of the prairie and could be seen from quite a distance. It contained a set of seven eggs. Another found June 3 held a set of five fresh eggs, some of which were distinctly marked with brown.

Accipiter cooperi. COOPER'S HAWK.—Nests quite commonly in the timber along the river and even in the small artificial groves near the farms. On May 20 I located two nests with four and five eggs respectively. Both were typical and both were placed in elm trees less than twenty feet from the ground.

Buteo borealis krideri. KRIDER'S HAWK.—On May 6 I collected a set of two fresh eggs from a nest placed in an elm tree near the river. The nest was up about forty feet. The eggs are white, boldly marked with light brown spots.

Falco sparverius sparverius. SPARROW HAWK.—This pretty little hawk seems to be quite common wherever there is an opportunity to find a suitable nesting site. On April 15 a pair were investigating some martin boxes I had set up in the spring of 1916. I then made two boxes more suitable for the hawks, and both were accepted. One placed near the Indian School contained on May 14 a set of five fresh eggs, and the other placed on a little island in the river had a set of five on May 23.

Asio wilsonianus. LONG-EARED OWL.—On May 20 I discovered an owl of this species in an old crow's nest in a little grove about three miles northwest of the city. I found five heavily incubated eggs in the nest. The owl stayed on the nest until I was only a few feet below it.

Asio accipitrinus. SHORT-EARED OWL.—Walking across a last year's wheat field on May 20, I flushed one of these owls from a nest with seven almost fresh eggs. On June 1 I found another nest containing four fresh eggs, but a horse had stepped in the nest and broken them. A few days later I found another nest in the same field which contained two fresh eggs, but these were also destroyed.

Otus asio asio. SCREECH OWL.—This little owl seems to be very common, and I have seen several, mostly on the little island in the river. On May 27 I found a Flicker nesting in a hole in a dead stump and under the tree were the shells of several eggs of the Screech Owl. A few days before I had found a dead Screech Owl near the same spot.

Ceryle alcyon alcyon. BELTED KINGFISHER.—Very common along the river, and one or more nest holes can be seen in almost every steep bank on both the North Dakota and Minnesota side.

Melanerpes erythrocephalus. RED-HEADED WOODPECKER.—Fairly common. On June 11 a nest with six fresh eggs was found in a dead stump on the island. Nest hole about fifteen feet from the ground.

Colaptes auratus luteus. FLICKER.—Very common. One of my nesting boxes was occupied and a set of seven eggs laid. Some boys broke off the top of the box, but the Flicker hatched the eggs and raised the young ones just as if nothing had happened.

Chætura pelagica. CHIMNEY SWIFT.—Very common and I find them nesting in several chimneys at the Indian School.

Archilochus colubris. RUBY-THROATED HUMMINGBIRD.—I have seen several Hummingbirds in this locality, and July 3 I collected a nest with two fresh eggs about a mile and a half north of Wahpeton, about fifty feet from the river. The nest was placed about twenty feet up in an elm and twelve feet out on a slender limb. June 28 I saw the female building, bringing nesting material every few minutes, and on July 1 the nest was finished and one egg laid.

Tyrannus tyrannus. KINGBIRD.—Very common. Fresh eggs can be found in the last part of June. Sets generally consist of three to four eggs, and nests are placed from two to sixty feet from the ground. On June 25 I found a nest in which were three eggs of the Kingbird and two Cowbird's eggs.

Tyrannus verticalis. ARKANSAS KINGBIRD.—Very common. All the nests found were placed in the lower dead branches of Cottonwoods between ten and thirty feet up. In a grove of about an acre I found seven nests with sets of three to four eggs. I never saw the nest placed on the ground but as I very often met both this and the former species on the prairie far from trees and saw them there in pairs for weeks I feel convinced that they either nest on the ground or in weeds.

Myiarchus crinitus. CRESTED FLYCATCHER.—On July 1 near the river I noticed a Crested Flycatcher entering a Flicker's hole with nesting material. The nesting hole was in a dead stump thirty feet from the ground. I did not have an opportunity later to investigate the nest.

Myiochanes virens. WOOD PEWEE.—Very common along the river.

Empidonax minimus. LEAST FLYCATCHER.—Very common. I found several nests; each containing four eggs and sometimes a Cowbird's egg.

Cyanocitta cristata cristata. BLUE JAY.—Not very common. A few pairs nest in the timber along the river.

Corvus brachyrhynchos brachyrhynchos. CROW.—Fairly common. A set of six fresh eggs was collected from a nest placed in an elm on the island in the river on April 23, and May 20 a nest with five nearly full grown young was located in a small grove about three miles northwest of the Indian School.

Dolichonyx oryzivorus. BOBOLINK.—Very common. These birds nest in the cultivated grass and cloverfields. I have never found them nesting on the prairies.

Molothrus ater ater. COWBIRD.—Very common. I found Cowbirds' eggs in the nests of Brown Thrasher, Robin, Kingbird, Least Flycatcher, Yellow Warbler, Red-winged Blackbird, Rose-breasted Grosbeak and Goldfinch.

Agelaius phoeniceus phoeniceus. RED-WINGED BLACKBIRD.—Common. The Red-wing nests in all low, damp places with tall grass or weeds. I have several times found two or three Cowbirds' eggs in the nest of this Blackbird.

Sturnella neglecta. WESTERN MEADOWLARK.—Very common. The Meadowlark arrives in the last week of March, and nests may be found by May 1. Sets of four to six eggs are common but I have seen as few as two in a set. The Meadowlark is much more common in the vicinity of buildings than in the open.

Icterus galbula. BALTIMORE ORIOLE.—Fairly common. Nests may be found about the middle of June in tall cottonwoods.

Euphagus cyanocephalus. BREWER'S BLACKBIRD.—A colony of about ten pairs was located in a plowed field near the Indian School. The nests contained five eggs each.

Quiscalus quiscula æneus. BRONZED GRACKLE.—Common. These noisy birds were nesting in the shade trees in the city streets. A colony of fifteen nests was found in a small grove of wild plums. On May 17 the nests contained five to six fresh eggs.

Astragalinus tristis tristis. GOLDFINCH.—Common. Nests were usually found in small shade trees. August 6 I located a nest in a small elm, with a set of four fresh Goldfinch eggs and one Cowbird's egg.

Passer domesticus. ENGLISH SPARROW.—Very common. I found the English Sparrow nesting both in trees and buildings, wherever there was an opportunity to place a nest.

Poœcetes gramineus gramineus. VESPER SPARROW.—In a wild plum thicket near the river I noticed a pair of this species feeding young.

Ammodramus savannarum bimaculatus. GRASSHOPPER SPARROW.—Common in all grass fields. On June 3 I located a partly arched over nest containing five fresh eggs of this species in an alfalfa field.

Passerherbulus lecontei. LECONTE'S SPARROW.—Common. I was only fortunate enough to find one nest of this little sparrow. It was placed in dry grass on the prairie. A set of four eggs was collected on May 27.

Spizella passerina passerina. CHIPPING SPARROW.—One nest of this species was found in a shade tree on 8th Street. I did not look into the nest, but the bird was incubating.

Spizella pallida. CLAY-COLORED SPARROW.—I saw a pair of these birds feeding young near the State Science School.

Spizella pusilla (arenacea?). FIELD SPARROW.—Fairly common. Nesting in the brushwood along the river.

Melospiza melodia melodia. SONG SPARROW.—Have seen several of these sparrows, but only located one nest. This was on June 30 and it contained five young sparrows and two addled Cowbird's eggs.

Zamelodia ludoviciana. ROSE-BREADED GROSBILL.—Fairly common. On June 11 I found a nest with three eggs of this species and one Cowbird's egg. June 27 another nest was located containing three heavily incubated eggs, and June 28 one more nest, with three newly hatched young. All were near the river.

Spiza americana. DICKCISSEL.—I have only seen one pair of these birds, and I did not locate a nest, but for about two weeks in June, the male could always be seen on top of bushes or weeds near the edge of an alfalfa field near the river. The alfalfa was then cut, and I did not see the birds again.

Progne subis subis. PURPLE MARTIN.—Very common. The Purple Martin was nesting all over the city. At the Indian School I set up a number of bird-boxes in which seven pairs were nesting. In June sets of four or five eggs were laid, but very few young ones were raised, as the English Sparrows were continually fighting the Martins and would go into the boxes and destroy the eggs.

Petrochelidon lunifrons lunifrons. CLIFF SWALLOW.—Common. I located a colony of twenty-five nests on a barn near the Indian School. On June 26 most of them had young.

Hirundo erythrogastra. BARN SWALLOW.—Very common. One pair were incubating a set of five eggs in a garage at the Indian School, when the building was lifted on rollers and carried about one hundred and fifty feet and turned, so the door, which had been facing east now is toward the south. In spite of all this disturbance the Swallows hatched their eggs and reared their young ones.

Riparia riparia. BANK SWALLOW.—Very common. I found them nesting in large numbers in the river banks. In one colony near the Indian School I counted more than five hundred nests.

Stelgidopteryx serripennis. ROUGH-WINGED SWALLOW.—Some of this species were nesting in the river banks, but not in such numbers as the Bank Swallow. I only located two nests, one of which contained a set of five heavily incubated eggs on June 26.

Lanius ludovicianus excubitorides. WHITE-RUMPED SHRIKE.—One nest of this species was located in a cottonwood about twelve feet from the ground, and on April 23 a set of six fresh eggs was collected. About two weeks later the birds were again incubating a set of six eggs.

Vireosylva olivacea. RED-EYED VIREO.—Fairly common in the shrubbery and timber along the river.

Dendroica aestiva aestiva. YELLOW WARBLER.—Very common. Nesting wherever a few bushes were to be found. In about one half of the nests located, were deposited eggs of the Cowbird. Quite often the warblers would build a new nest on top of one in which a Cowbird's egg had been laid. (See 'The Auk,' October, 1916).

Dumetella carolinensis. CATBIRD.—Nests were common along the river and a few were found in the groves around the farm buildings. Sets of five eggs are common in this locality.

Toxostoma rufum. BROWN THRASHER.—Common. Nesting from one to twenty-five feet from the ground. Sets of four and five eggs were common, and at times one or two Cowbird's eggs were placed in a nest.

Troglodytes ædon parkmani. WESTERN HOUSE WREN.—Very common. I set up ten wren boxes, and eight were occupied. Fresh sets of six and seven eggs were found from June 10 to July 1. I made the boxes with different sized entrance holes — $\frac{3}{4}$ to $1\frac{1}{4}$ inches — and I noticed that the boxes with the largest holes were occupied first.

Planesticus migratorius migratorius. ROBIN.—Very common. Robins were found nesting both in trees and on buildings. One nest was placed on a fire escape at the Indian School. Some of the nests contained a Cowbird's egg.

Sialia sialis sialis. BLUEBIRD.—Not very common. The Bluebirds here seem to be nesting very late. July 22 a set of four eggs was found in one of my nesting boxes.

GENERAL NOTES.

***Larus nelsoni*, in Juvenal Plumage, from the Hawaiian Islands.**—Nelson's Gull, *Larus nelsoni* Henshaw, is one of the rarest of North American Laridæ, and its juvenal plumage is apparently undescribed. It was therefore with considerable interest that the writer discovered among the unidentified gulls in the United States National Museum a female specimen of *Larus nelsoni* in juvenal plumage, No. 169682, U. S. N. M., collected by Mr. H. W. Henshaw at Hilo on the Island of Hawaii, in the Hawaiian Islands, March 13, 1899. This record adds the species to the list of Hawaiian birds. A few notes on this individual may be acceptable in the present connection.

This Hawaiian Island individual is rather small, about the size of the smallest specimens of *Larus hyperboreus* in the United States National Museum collection, and measures as follows: wing, 400 mm.; tail, 155; exposed culmen, 55; tarsus, 66; middle toe without claw, 53. The colors of the soft parts, as indicated on the label, are: "bill black; legs and feet pinkish; eyes hazel."

The juvenal plumage of *Larus nelsoni*, which this specimen evidently represents, is much like the corresponding stage of *Larus hyperboreus*, from which it differs conspicuously in its wholly black or blackish bill (in which respect it agrees with the juvenal plumage of *Larus glaucescens*), since the bill in even the nestling of *Larus hyperboreus* is blackish only at the tip. In plumage it differs principally from *Larus hyperboreus* in its darker posterior lower parts; more extensively dusky ocular region; and, on the terminal portion of the outer webs of the first three or four

primaries, in the presence of dusky streaks, similar to those in the adult, but less extensive. These, however, in this specimen, are barely noticeable on the left wing.

From juvenal *Larus glaucescens* it differs noticeably in its much paler upper parts, wing-quills, and rectrices. Furthermore, the outer edges of the secondaries are broadly white or whitish terminally, forming a rather conspicuous whitish patch on the closed wing; and there are dusky streaks on the outer webs of the terminal portion of the first few outer primaries; both of which characteristics are absent in juvenal *Larus glaucescens*. The postocular dusky streak is, moreover, much shorter and less conspicuous than in the corresponding plumage of *Larus glaucescens*, but whether this is a specific character or merely an individual variation is not certainly determinable by the material at hand, though it appears to be constant.—HARRY C. OBERHOLSER, *Washington, D. C.*

***Anas rubripes rubripes* in North Dakota.**—Through the courtesy of Mr. H. V. Williams of Grafton, North Dakota, I am able to place on record a North Dakota specimen of *Anas rubripes rubripes*. This bird was taken at Minto, Walsh County, in northeastern North Dakota, on April 10, 1909, and is now in Mr. Williams' collection. It appears to be the first definite record of this form for the State of North Dakota.—HARRY C. OBERHOLSER, *Washington, D. C.*

***Melospiza melodia phæa* in Southern California.**—A specimen of this form collected by me at Placerita Cañon, Los Angeles Co., on February 18, 1917, appears to be the only one known from the southern part of the State, and is therefore noteworthy. The bird was a female, and is now in the U. S. National Museum, where it was identified by Dr. H. C. Oberholser. The few previous records of this subspecies in California appear to be restricted to the northern half of the State, in Del Monte and San Mateo Counties.—EDWARD J. BROWN, *Los Angeles, Cal.*

***Numenius americanus americanus* not a Breeding Bird of Michigan.**—Mr. B. M. Swales has kindly called my attention to the unreliability of a Michigan breeding record in my recent paper on *Numenius americanus* (cf. 'The Auk,' XXXV, No. 2, April, 1918, pp. 189-190). In the United States National Museum there is a single curlew's egg, supposed to have been collected by a Mr. C. P. Davis at Jackson, Michigan, and which is so entered in the catalogue and other records of the National Museum oölogical collection. The original entry, which by some inadvertence I failed to verify, made in 1860 by Professor Baird, shows that he was suspicious of the authenticity of this specimen and even of its being from America. Since it was obtained from Mr. Davis among a lot of miscellaneous birds' eggs from various parts of the world, and since there is no positive evidence that it was really collected in Michigan, it seems altogether too doubtful

to be upheld as a breeding record for that State. This explanation is here made in order that the facts in this case may be available to workers in Michigan ornithology. By the elimination of this record the eastern known limits of the breeding range of *Numenius americanus americanus* become restricted to southern Wisconsin and northern Illinois.—HARRY C. OBERHOLSER, *Washington, D. C.*

The Rough-legged Hawk (*Archibuteo lagopus sancti-johannis*) at **Washington, D. C.**—The Rough-legged Hawk is of sufficient rarity in the District of Columbia to warrant placing on record a specimen which came into my possession on January 1, 1918. The bird, wounded and unable to fly, was picked up by some boys in the open country north of Woodridge, close to the eastern line of the District. Previous records from this region are as follows:¹

1859 — one.

December 29, 1879 — one seen by H. W. Henshaw.

1880 (winter) — one.

December 23, 1882 — specimen in U. S. Nat. Mus.

March 17, 1888 — Sandy Spring, Maryland; specimen.²

March 30, 1888 — one seen by Chas. W. Richmond.

January 1, 1895 — one seen on Potomac flats by E. A. Preble.—

ARTHUR H. HOWELL, *Washington, D. C.*

Occurrence of Goshawks (*Astur a. atricapillus*) and **Saw-whet Owl** (*Cryptoglaux acadica*) in the **Vicinity of Washington, D. C.**—It is interesting to note that the Goshawk in the extended winter migrations of 1916 and 1917 reached the vicinity of Washington, D. C. Mr. T. A. Davis secured a fine adult at the Bureau of Animal Industry farm near Beltsville, Maryland, December 20, 1917. It was captured in a trap set beside a large rooster it had killed.

Mr. Davis states that he shot two others of this species at the same locality September 1 and 2, 1916. The only previous record in this vicinity was of an adult female killed at Sandy Spring, Maryland, December 27, 1887.

A female Saw-whet Owl (*Cryptoglaux acadica*) taken in a grove of small pines at Sandy Spring, Maryland, November 30, 1916, was one of the northern species which drifted south in the autumn of 1916.—A. K. FISHER, *Washington, D. C.*

Large Flight of Great Horned Owls and Goshawks at Hadlyme, Connecticut.—Under date of December 29, Mr. Edward H. Forbush of Massachusetts wrote me that early in November, he had learned from Canada that probably because of the great dearth of rabbits in the north a great flight of Horned Owls and Goshawks was coming south.

¹ Cf. Cooke, Proc. Biol. Soc. Washington, XXI, 1908, p. 116.

² Fisher, Hawks and Owls of the U. S., Bull. 3, Div. Orn. & Mamm., 1893, p. 91.

In November and December many Goshawks appeared at Hadlyme, also many Great Horned Owls; the latter being very commonly heard and seen until into February. The game keeper of a pheasant farm at Hadlyme trapped and killed during the fall and winter up to March 10: 91 Great-Horned Owls; 25 Barred Owls; 15 Screech Owls; 9 Long-eared Owls; and 84 Goshawks, and from September 1916, to March 10, 1918, 74 Red Shouldered Hawks; 60 Cooper's and Pigeon Hawks; and 35 Sharp-shinned and Sparrow Hawks.

The keeper placed eight Horned Owls in a wired enclosure and kept them for some time during the month of January until they began killing and eating each other. This was kept up until only two remained. They were well fed all of the time they were in captivity on dead pheasants killed by other hawks and owls, and Starlings were also shot for them.

The Great Horned Owl has been fast nearing extermination in Connecticut as a permanent resident.—ARTHUR W. BROCKWAY, *Hadlyme, Conn.*

Megaceryle vs. Streptoceryle.—In a paper on the Classification of the Kingfishers (Bull. Am. Mus. Nat. Hist., 1912), the writer showed that the range of variation in size, form and coloration in the genus *Ceryle*, as commonly recognized, is so great that the two subgenera of the A. O. U. Check-List (1910), *Megaceryle* and *Chloroceryle*, should unquestionably be given generic rank. Working independently, Mr. Ridgway (Bds. N. & M. Amer., VI, 1914, p. 407), treated not only these two groups as full genera but gave equal recognition to *Streptoceryle*, a segregate of *Megaceryle*. The former includes the two American species *M. alcyon* and *M. torquata* and the African *M. maxima*, while *Megaceryle* is restricted to the two closely allied Asiatic species *M. lugubris* and *M. guttulata*.

Mr. Ridgway separates *Streptoceryle* and *Megaceryle* on account of supposed differences in the form of the bill, relative length of tarsus and inner toe, and coloration. Regarding the character of the feet, I can find no difference whatever, the relative length of the tarsus and toes being remarkably uniform in all the species of the group. So far as general coloration is concerned, the Asiatic species are not essentially different from the African *M. maxima* which connects the former with the American species. In fact, in the markings of the primaries the Old World species are in close agreement with each other, while those of the New World are decidedly different. The coloration of all the forms of *Megaceryle* (*sensu lato*) may be considered of one diversified type as opposed to the different styles of color or pattern seen in *Chloroceryle* and *Ceryle*.

There remains as distinctive of *Streptoceryle* only the form of the bill. This is somewhat more slender, with straighter culmen, the tip of the maxilla more tapering and acute, and the gonys more strongly upcurved. In view of the close resemblance in all other points of structure and the essential agreement in size and coloration, I believe that *Streptoceryle* may profitably be relegated to synonymy. It is significant that Bonaparte in proposing *Streptoceryle* restricted it to the two American species,

torquata and *alcyon*, the African *maxima* being considered a *Megaceryle*. It is a question whether *M. alcyon* is not actually the most distinct species of the genus, differing as it does in its small size, slender bill, and pointed wing, and in certain details of coloration. This fact also weighs against the recognition of *Streptoceryle*.

As further bearing on this question, the case of *Chloroceryle* is worthy of attention. *C. amazona* differs from its three congeners in its distinct crest, nearly even tail, relatively longer second toe, eighteen (instead of fourteen or fifteen) secondaries, and in its larger size. While absolute consistency in our classification is probably impossible of attainment, yet in this particular case the proper course seems clear, namely that if *Streptoceryle* be recognized, then *Chloroceryle* must also be divided. In its coloration, eutaxic wing and scaleless tarsus, *C. amazona* agrees with the three other species of the genus, and as in the case of *Megaceryle*, it seems far better to leave this natural genus intact.—W. DeW. MILLER, *American Museum of Natural History, New York City*.

The Sapsucker Wintering in Central Maine.—Inasmuch as the Yellow-bellied Sapsucker is a bird of evil repute the facts about to be recorded may not be particularly welcome but as the couplet

“In men whom men condemn as ill
I find so much of goodness still,”

may be true also of ‘our little brothers of the air’ I wish to speak a good word for this much maligned bird.

The Sapsucker is a bird which is not common in our locality. Previous to the winter of 1911–1912 I had seen it only rarely, during migrations, the dates being April 17–19 and October 3–5. Therefore I was much surprised on December 11, 1911, to observe one of these birds in our apple tree in company with a Downy. At first I thought it simply a tardy migrant, but when its visit was repeated on the 13th, 14th and 15th of the month, with snow falling on the last day, my curiosity was aroused to see whether it would winter with us. The nearest approach I could find to a statement of its wintering in our latitude was in an article which appeared in the ‘Lewiston (Maine) Journal,’ under date of April 21, 1898, in which the writer says that the Yellow-bellied Sapsucker, “is said to be migratory, but if he is, he frequently stays with us very late and returns very early,” but this statement seems too indefinite to prove the point in question.

My observations were made from the windows of my home and the trees which the bird visited so regularly were sufficiently near to allow most excellent views of him in all positions. He appeared on the 18th, 19th, and 30th of December and on New Year’s Day he spent nearly the entire forenoon in the apple trees near the house, lunching from the frozen fruit which had been left on the trees and hunting over the trunks and branches.

On January 2, he evidently came as soon as it was light and remained until nearly dark, putting in a nine-hour day of hard work without intermission,

going at intervals to peck at the apples, but spending the greater part of the time upon the trunks of the trees. The vigorous way in which he threw off great flakes of bark was amusing, and quite a quantity of bark accumulated on the snow under the trees. Who shall say that this work on the trees was not beneficial? One pretty habit which may be worth noting is that while pecking at the apples he would often cling with his feet to the apple he was eating and hang, head-downward, as chickadees so often do.

On January 3, he was here the greater part of the forenoon, but about noon there was a great commotion and we rushed to the window only to see an impending tragedy. A Northern Shrike was chasing our Sapsucker. Nearly two weeks elapsed during which time I grieved over the untimely fate of the little feathered friend I was watching with so much interest,—two weeks of extreme cold and of severe storms. On the afternoon of January 16, however, he returned to his old haunts, eating apples and hunting on the tree trunks alternately. He did not seem quite as strong and active as before, owing, perhaps, to the severe weather of the previous fortnight, the mercury having ranged from 28° to 32° below zero.

It was interesting to me to notice on this occasion the perfection of his protective coloring. The trunks of the trees were quite snowy with the rather damp snow clinging to the bark and as the bird remained almost motionless for some time on the trunk of an apple tree his spotted back and the longitudinal stripes on his wings simulated the bark of the tree with the snow upon it so as to almost defy detection. I could locate him only with difficulty even though I knew just where to look. The next day he came again and seemed as sprightly as ever and we also saw him January 19–22, 24 and 31, February 2, 6 and 9, and March 1, 3, 5, 10, 12 and 20. He was also present April 2 and 5, after which date I surmise that he went farther north.

Since that year I have seen the Sapsucker only occasionally during the migrations, the dates being approximately as previously given, in April and October.—HARRIET A. NYE, *Fairfield Center, Me.*

A Crested Flycatcher injured by Swallowing a Grasshopper.—At Royal Palm Hammock, Dade County, Florida, January 24, 1918, I noticed a Crested Flycatcher (*Myiarchus crinitus*) fluttering along the road through the jungle, unable to fly. I caught it in my hand and found it weak and much emaciated. Closer examination and dissection showed a grasshopper's femur about an inch long in the abdominal cavity, the larger end protruding for a distance of a quarter of an inch, but not having punctured the skin. This leg had apparently been swallowed by the bird and had worked through the wall of the stomach into the abdomen.

I am indebted to Mr. Alexander Wetmore, of the Biological Survey, for the following notes on the injury to the stomach:

"Examination of the stomach showed a hole through the wall at the extreme lower end of the ventriculus, slightly to one side, where the stomach

wall was thin. This opening was nearly a millimeter across and was evidently of old standing, as the corneous hardened gizzard lining extended through to the outer surface, completely sheathing the walls of the opening. There was a slight depression on the outer surface of the stomach, evidently made by the projecting leg. This depression was lined with a thickened, skin-like deposit. The stomach lining had been shed recently as part of the old inner surface still adhered at one side near the wound.

The stomach was full, containing berries, Pentatomid remains, tibia of a locustid, etc."—ARTHUR H. HOWELL, *Washington, D.C.*

An Attempt to Breed the Pine Grosbeak in Captivity.—The last week in January, 1917, I heard of a small flock of Pine Grosbeaks or "Canada Robins" as they are called locally, in a grove of red cedars about a mile and a half from my home. The morning of January 28 with bright sunshine and thermometer hovering around zero, I took a bamboo fish pole about eight feet long with a short stout piece of string and slip knot that would hold open three or four inches and went fishing for them. I found a flock of at least twenty-five Pine Grosbeaks *all* in the gray plumage and about the same number of Evening Grosbeaks, the first ever noted here. It was a beautiful sight to see half a dozen of each kind feeding on cedar berries from the same branch. The Pine Grosbeaks were very tame, as is usual when in this latitude, but I could only approach within about thirty feet of the Evening Grosbeaks when they would go off in a startled whirl like a bunch of English Sparrows.

I soon secured three of the Pine Grosbeaks, one of which was much darker than the other two and I judged it to be a female. Returning home I put them in a cage 24 x 18 x 12 inches which I placed in the living room. The birds quickly became contented and in a few days would take hemp seed from my hand or mouth. The second week in February the two brighter colored birds began to sing a low sweet warbling song and at other times kept up a pleasing conversation.

Wishing to keep a pair, male and female, I sent one of the singing birds to the Bronx Zoo where it died in a week or two and was dissected and found to be a male. About the middle of June my singer dropped dead from the perch one morning, and dissection proved it a female. The remaining bird appeared lonesome and for about a week often made the whistling call. The cage was then hung outside the kitchen window over which a grapevine was growing, with a wide board over the top to keep off the rain and within a few days the bird began singing with even more vigor and vim than the others had shown. The first week in July I noticed her hopping about the cage with bits of grass in her beak trying to fasten them somewhere so I placed a wire bowl in an upper corner and put in nesting material—shredded bark, sticks, grass and a few feathers, with which she at once began to fill the bowl and within a week had formed a very good nest. In this on July 9 she deposited an egg and by July 15 she had completed the clutch of four perfectly typical eggs. Being infertile I had to add them to my collection.

During the nesting period the bird would eat from one to three moderate sized angleworms a day. It did not bolt them down after the manner of the robin but bit off small pieces and chewed them before swallowing. Cuttle bone was also in demand. This feeding continued for perhaps three weeks and again during the moult in September and October. At other times the bird would take no animal food although insects and worms of various kinds were offered. Its staple food was canary millet, rape, oats and a little sunflower seed with plenty of fruit and succulent grass, lettuce, cabbage and apple cores. The past winter the cage has hung outside with a hood of transparent celluloid to cover the upper two thirds for shelter and wind break. I hoped that the Pine Grosbeaks would visit us again and that my lady bird by calling might help me to obtain a mate for her. None visited this part of Connecticut the past winter, however, and I think but very few came below latitude 45°. I still have hopes of breeding them in captivity as they very soon become tame and contented with cage life. My bird did not mind the cold of the zero week during which she had an extra allowance of hemp and sunflower seed and a bit of suet. She began singing February 1 and at present writing, March 24, 1918, is singing much of her time, using her whistling call notes when Robins or Starlings fly near. Her song is identical with that of the male and rather reminds one of the song of their pigmy representative the Purple Finch but lacks the ringing quality.

If I obtain a male to mate with my bird another year and should succeed in breeding them, there are several experiments to be made. One is to see if birds raised here and given their liberty would remain throughout the year and another in regard to color changes in the male.—GEO. M. MARCKRES, *Sharon, Conn.*

The Systematic Position of *Calyptophilus*.—One of the most peculiar of the many aberrant Antillean forms is the monotypic genus *Calyptophilus* of Haiti. This form was originally described by Cory in 1883 as *Phœnicophilus frugivorus*, and the following year the describer proposed for it the generic name by which it has since been known.

Slater (Cat. Bds. Brit. Mus., XI, 1886), considered the two genera *Phœnicophilus* and *Calyptophilus* to form a subfamily of the Tangaridæ confined to the island of Haiti. At the same time he remarked, "I have some doubts whether the Phœnicophilinæ ought to be included at all in the Tanagrine series."

Notwithstanding its peculiarities *Calyptophilus* was allowed to remain in the Tangaridæ until 1902 when Ridgway (Bds. N. and M. Amer., III, p. 1), after enumerating several genera that he considered out of place in the Tangaridæ added, "Another genus must also be removed. This is *Calyptophilus* Cory, usually placed next to *Phœnicophilus*; but being a 'ten-primaried' bird, it obviously does not belong here. *Calyptophilus* is of very doubtful position, but probably is a member of the Mimidæ." Accordingly in Part IV (1907) of the same work we find *Calyptophilus* as a

doubtful member of the Mimidæ, constituting the subfamily Calyptophilinæ.

Cory, in the recently issued Part II, No. 1, of his 'Catalogue of Birds of the Americas', has raised the subfamily to family rank as " ? Calyptophilidæ" with the comment that " the monotypic genus may later be considered to represent a subfamily."

I have recently had the opportunity of examining nine perfect skins of this species in the collection of Dr. L. C. Sanford. These prove that *Calyptophilus* is not ten-primaried as stated by Mr. Ridgway, but typically 'nine-primaried,' the tenth primary being a minute concealed vestigial quill varying from 4 to 8.5 mm. in length. There is no longer any reason for retaining this genus in the Mimidæ, and I believe that for the present, at least, it should be restored to its former position in the Tangaridæ next to *Phenicophilus*, and in the neighborhood of *Tachyphonus*, *Mitrospingus* and *Rhodinocichla*. I would also suggest that the name of Chat-Thrasher bestowed by Mr. Ridgway be emended to Chat-Tanager.—W. DEW. MILLER, *American Museum of Natural History, New York City.*

***Junco aikeni* in New Mexico.**—In the last (1910) edition of the American Ornithologists' Union 'Check-List of North American Birds,' *Junco aikeni* is reported as of casual occurrence in New Mexico. Since there is no previous printed information that authenticates this statement, it seems worth while to place on record the single specimen that forms its basis, and this more since it forms the only record for New Mexico, and, furthermore, represents the southwestern limit of the known winter range of the species. This individual is now in the Biological Survey collection (No. 192902, U. S. Nat. Mus.) and is a female in juvenal plumage, collected two miles north of Arroyo Seco, New Mexico, at an altitude of 8000 feet on January 20, 1904, by Mr. M. Surber.—HARRY C. OBERHOLSER, *Washington, D. C.*

Notes on Some Bird Fossils from Florida.—On May 15, 1918, Dr. E. H. Sellards, State Geologist of Florida, sent me a small lot of fossil bird bones from Tallahassee and they were received a few days after that date. In the letter of transmittal Dr. Sellards states that one of these specimens is " a bird bone that came from an Indian mound. This bone is marked merely x, no other number." I find it to be the left humerus of a Florida Cormorant (*Phalacrocorax a. floridanus*), nearly perfect, and in a subfossilized condition, being of a rather pale earth-brown color and very pliable.

In referring to these " scraps " in his letter of the fourteenth of the same month Dr. Sellards says that " The one small piece of bone differing from the others in color is from a different locality. I find it in a collection from the Pleistocene at Camp Dam on the Withlacoochee River, and presumably it was taken in that locality although it seems to have escaped getting a number assigned to it." This bone is the distal end of a right tarsometatarsus.

tarsus and belonged to a bird of medium size. It is well fossilized but is too fragmentary for definite reference.

All the remaining bones in this collection belonged to the Wild Turkey (*Meleagris gallopavo*) and apparently to the same adult individual. They are thoroughly fossilized and as fragmentary parts of bones, more or less perfect. In color they are generally of a pale cream white, blotched and otherwise rather sparingly marked with deep brown and rusty. The right coracoid is slightly chipped, otherwise nearly perfect. This is likewise true of the distal third of the right ulna found in the lot, and the distal portions of the two carpometacarpi, of which there is the lower two-thirds of the right tarso-metatarsus.

These turkey bones all came from the Pleistocene cavern deposits at Ocala, Florida, and bear the following original numbers, to wit: 7799, 7800, 7934, 7946, and 7954. They will probably be added to the collections of the U. S. National Museum, where they now are, and I have the permission of Dr. Sellards to publish the above notes in regard to them.

Among these I find a vertebra of the neck of a turtle — the ninth in the chain, which, in this genus, is the one articulating with the first co-ossified vertebra of the carapace. It came from a large-sized, soft-shelled turtle that apparently belonged to a specimen of *Apideretes*, possibly *ferox*, the group to which the fossil soft-shelled turtles are usually referred, while the form of that genus now found in Florida is *Trionyx ferox* or *Amyda ferox*. The last free vertebra of the neck in these turtles is very differently formed from any other in that section of the spine. It is spreading and much flattened from above downward. This is the fossil vertebra we have, and it is my present intention to describe it elsewhere; it is only noted here in that we may know what other animals were in existence in Florida at the time the Pleistocene Wild Turkeys flourished there.— ROBERT WILSON SHUFELDT, *Washington, D. C.*

A Note Concerning Bird Mortality.— On December 24, 1917, at Norwalk, Conn., while taking a Christmas census for 'Bird-Lore,' I had an experience so unusual and interesting that I believe it worth putting on record. In the course of the morning I noted a Field Sparrow (*Spizella pusilla pusilla*) flying from one clump of bushes to another, and chipping rather excitedly. Not identifying it immediately I watched it for some time. It finally flew into the low hanging limb of a Norway spruce, and then dropped vertically down into a hollow in the snow, where I could not see it. The chipping noise ceased, and though I watched for some time, the bird did not reappear. I finally walked cautiously up to the hollow under the spruce limb, and found the bird lying upon its back. I picked it up. Every muscle in its body was rigid. Its feet were extended up straight and its eyes were open wide. Its breast was inflated as though the lungs were filled with air that it could not expel. Thinking it suffering from cold, I tried to warm it in my hand. Soon its muscles relaxed, its eyes closed, its head drooped and it died in my hand.

Dissection of the body later, showed no apparent cause of death save that there was little food in the stomach, a condition that could not be considered abnormal early in the morning. But the stomach contained no small pebbles or grit, such as are generally present in the stomachs of seed-eating birds. There had been snow on the ground for several days, so that possibly the bird could not get such material, and this might have been the cause of death. The body was not in the least emaciated, however, so that if this lack caused death, it was rather by something akin to acute indigestion than by starvation. The previous night had not been unusually cold, and weather conditions up to that time were normal.

That afternoon I picked up a dead Song Sparrow (*Melospiza melodia melodia*) that had possibly met its death in the same manner. The number of birds that are found dead is larger than most of us realize. Last spring twenty-four birds were brought to me by pupils of the Bridgeport High School. The West Haven High School has a very good collection of mounted birds, nearly all birds that were found dead and brought in by pupils. Most of such birds that I have examined have shown no sign of injury. Probably many birds die in this sudden manner, but the chances of an observer actually witnessing such a death must be very slight.—ARETAS A. SAUNDERS, *Norwalk, Conn.*

Birds and Mulberries.—Though it is well known that mulberries are very attractive to many species of birds, an instance of this attractiveness that seems worthy of record has recently been observed by the writer.

On the farm of Mr. J. B. Golsan, near Prattville, Ala., is a small orchard of nine "Everbearing" mulberry trees situated only a few rods from the barnyard in a corner of the pasture, and surrounded on three sides by woods and thickets. On April 29, 1918, these trees, covered with ripening fruit, were kept under close observation from 3:15 until 5:15 P. M., and though the day had been mostly cloudy, with some rain — by no means ideal for birds — twenty-two species were recorded in the orchard in that short time. Next day (April 30) three additional species (Towhee, Chat, and Carolina Wren) were recorded by the writer and one (Hairy Woodpecker) by Mr. Lewis S. Golsan. No attempt was made to count the host of individuals which was constantly passing between the mulberry trees and the surrounding woods. The list of species follows, the asterisk denoting that individuals of the species so indicated were seen to actually swallow mulberries (a six-power binocular was used): *Dryobates v. auduboni*, **Dryobates p. pubescens*, **Melanerpes erythrocephalus*, **Centurus carolinus*, *Archilochus colubris*, **Tyrannus tyrannus*, **Myiarchus crinitus*, **Cyanocitta c. florincola*, **Icterus spurius*, **Icterus galbula*, *Passer d. hostilis*, **Zonotrichia albicollis*, **Pipilo e. canaster*, **Cardinalis c. cardinalis*, *Zamelodia ludoviciana*, **Passerina cyanea*, **Piranga erythromelas*, **Piranga r. rubra*, **Vireosylva olivacea*, **Icteria v. virens*, *Mimus p. polyglottos*, **Dumetella carolinensis*, **Toxostoma rufum*, *Thryothorus l. ludovicianus*, **Hylocichla mustelina*, and *Hylocichla f. fuscescens*.

In almost every instance the Orchard Orioles would pluck a whole berry and then hold it under one foot and eat it piecemeal. Indigo Buntings seemed very partial to a white variety of berry and paid little attention to the others. It is perhaps worthy of note that at the time these observations were made dewberries were ripening in great profusion along almost every hedgerow.—ERNEST G. HOLT, *Biological Survey, Washington, D. C.*

An American Edition of Audubon's 'Ornithological Biography.'—

In a recent bibliographical memoir of Audubon's work,¹ Doctor Stone included the American (Philadelphia, 1831) edition of volume one of the 'Ornithological Biography,' also mentioning that there was said to be another American edition of the same volume, dated 1832, and referring in a foot-note to Loomis' description² of a copy of this edition. Loomis states that this edition, which bore the imprint Judah Dobson, Agent, and H. H. Porter, is "wholly distinct so far as typographical features are concerned" from the Edinburgh edition and mentions, casually, the existence of an edition of the same year (1832) with the imprint of E. L. Carey and A. Hart, Philadelphia, which, apparently he had not seen, or had not at hand, as his statement that it is "the Edinburgh edition with the Philadelphia title-page" is misleading.

A copy of the E. L. Carey and A. Hart, 1832, Philadelphia edition is now before me. Like Loomis' copy it is wholly distinct typographically from the Edinburgh edition, but typographically similar to the Dobson and Porter, Philadelphia, 1831, edition, except the imprint of the title. A comparison of these two American editions of volume one, at hand, with the Edinburgh edition of volume one, seems to show that the first two were printed from the same setting of type, corresponding line for line throughout, all peculiarities of any given letter or alignment being the same. In this respect they differ from the Edinburgh edition, the minor differences in the spacing of letters or words alone making it clearly evident, where gross differences are wanting, that the work is of another setting of type.

So far as I am aware, the imprints on these two American editions of volume one have not been given. That of the Dobson and Porter, 1831, edition is as follows:—Philadelphia: (which is in black-letter) | Judah Dobson, Agent, 108 Chestnut Street; | and | H. H. Porter, Literary Rooms, 121 Chestnut Street. | MDCCCXXXI.

The imprint on the title of the Carey and Hart, 1832, edition is as follows:—Philadelphia: (which is in black-letter) | E. L. Carey and A. Hart — Chesnut Street. | MDCCCXXXII. In this edition Chestnut Street is incorrectly spelled, as given.

¹Witmer Stone. A Bibliography and Nomenclator of the Ornithological Works of John James Audubon. 'The Auk,' XXIII, 1906, pp. 298-312.

²Leverett M. Loomis. A Forgotten Volume. 'The Auk,' VIII, 1891, p. 230.

On the reverse of the title-page in both these editions is:—Entered according to the act of Congress, in the year one thousand eight hundred | and thirty one, by R. Harlan, M. D. in the Clerk's office of the District Court of the | United States, in and for the Eastern District of Pennsylvania. | Philadelphia: | Printed by James Kay, Jun. & Co. | Printers to the American Philosophical Society. | No. 4, Minor Street.

Both these editions, similar to one another, differ in minor points of typography from the Edinburgh edition. Loomis states that his copy differs from the Edinburgh edition in typography. It is likely that the several American editions of volume one were all printed from the same setting. The reading matter, so far as I have noted it, is the same in the two American editions as in the Edinburgh edition, also before me.

A few differences in addition to the title-pages which will satisfactorily identify the printed-in-Philadelphia, volume one, editions, may be pointed out: Typographical variation of the American editions from the Edinburgh edition, begin in the first page of the introductory address, (p. v), second line. In the American print this line ends with the word "no"; with the word "wish" in the Edinburgh edition. The printer's signatures are different throughout. On page 1, the "A" in the American edition is at the lower left hand corner; it is in the lower right and smaller sized, in the Edinburgh volume. Finally, the pages at the back containing the list of subscribers in the American editions runs over onto the sixteenth page, while in the Edinburgh copy it is completed on the fifteenth.

The pagination of the various editions is not different; the paper of the American editions is softer than the other. The size of the leaves is greater in the American editions, somewhat taller and half an inch wider. After discussing volume one of the 'Ornithological Biography,' Stone, in the paper previously cited, says that he knows of but the one edition (i. e., the Edinburgh) of the remaining volumes. A copy of the American edition of volume two has however recently come into my hands in a set, of which volume one is the Carey and Hart, 1832, edition, full imprint of which is given above; and volumes three, four and five the Edinburgh edition. Volume two of this American edition has the following imprint:—Boston: (which is in black-letter | Hilliard, Gray, and Company. | MDCCCXXXV. The title-page is otherwise an exact transcription of the corresponding Edinburgh edition, except that "&c. &c." becomes in the American edition "Etc. Etc." On the reverse of the title of the American edition is:—Entered according to Act of Congress, in the year 1835, | by Victor Gifford Audubon and John Woodhouse Audubon, | in the Clerk's Office of the District Court of the District of Massachusetts. | J. D. Freeman, Printer, | 110, Washington Street. This American edition of volume two is printed throughout from an entire reset of type, any and every page of which shows minor or greater differences from the Edinburgh, 1834, edition of volume two. To the casual reader, besides the differences in the title-page it may be pointed out that in the American edition the errata on | page 580 (unnumbered in both editions) are omitted, corresponding cor-

rections having been made in the text in the later (American) edition. The paper differs from that on which the corresponding Edinburgh edition is printed, being of excellent quality, and entirely free from foxing, the pages are larger, slightly trimmed, and the volume altogether a fine example of American book making.—WILLIAM C. BRAISLIN, M. D., *Brooklyn, N. Y.*

RECENT LITERATURE.

Loomis on the Tubinares.¹—As is generally known Mr. Loomis has been engaged in a study of the Tubinares for a good many years past. As early as 1895 there appeared the first of his series of papers on Californian water birds and following these he, as Director of the museum of the California Academy, organized an expedition to the Revilla Gigedo Islands which brought back a large collection of these pelagic birds to a study of which Mr. Loomis at once devoted himself. All of this material was destroyed in the disastrous conflagration of 1906, but the Academy's Galapagos Expedition under Mr. Rollo H. Beck, which returned in the same year, brought even richer material and upon this collection and other recent accessions, numbering upwards of two thousand specimens, Mr. Loomis's study is based. He has likewise visited the leading museums of the United States and studied their material while he has embodied the results of his own field studies and the manuscript notes of members of the two expeditions above referred to—Messrs. E. W. Gifford, Rollo H. Beck and Dr. A. S. Bunnell. Naturally his report constitutes a contribution of very great importance to our knowledge of these puzzling birds of the high seas and has been looked forward to with much interest by ornithologists.

The treatise has been prepared with much deliberation and in the scholarly style that has always characterized Mr. Loomis's writings while the author's thorough acquaintance with the literature of the subject is manifest on every page. It is divided into six parts: I. Historical; giving a brief sketch of the men and publications which have contributed to our knowledge of the group, including portraits of Coues, Salvin and Godman, after whom he has named the principal periods in the literature of the Tubinares; II. Geographic Distribution; III. Migration; IV. Variation; V. Classification and Nomenclature; VI. Results of the Study.

¹ A Review of the Albatrosses, Petrels, and Diving Petrels. Expedition of the California Academy of Sciences to the Galapagos Islands, 1905-1906. By Leverett Mills Loomis. Proc. Acad. Calif. Sci. Fourth Series, Vol. II, Pt. II, No. 12, pp. 1-187, pll. 1-17. April 22, 1918.

The last part comprises nearly two-thirds of the entire report and to the student of the *Tubinares* is the most important portion. It treats of the forty-four species obtained by the expedition and goes into great detail regarding variation in size and coloration, migration and habits. A vast and important addition is made to our knowledge of these birds but the evidence presented may very likely be interpreted differently by other students of the group, where it relates to the systematic arrangement of the forms.

In the section treating of classification and nomenclature Mr. Loomis considers all the known species, which he reduces to eighty-six in number, and gives his views upon these matters more concisely. His attitude as is well known is extremely conservative in regard to the recognition of species while subspecies he rejects entirely. To quote his own statement of his views: "Some ornithologists would differentiate all dissimilar geographic variation into subspecies; others would make selections and have 'practical subspecies.' Under the first method the separations become so fine that even typical examples can scarcely be determined. Under the second method the separations rest largely on the shifting sands of individual opinion. . . . In the present paper geographic variation is considered in connection with the other variations of species, the subspecies theory being discarded as a theory that has outlived its usefulness."

The flaw in Mr. Loomis's solution of this vexing question is that he presumes that "species" are things definitely established while as a matter of fact they are matters of personal opinion just as are "subspecies" and his action simply shifts the issue from determining which subspecies shall be recognized to deciding which forms are species and which are subspecies. When the custom of recognizing geographic forms by name, either binomially or trinomially, is practically universal, and when students will agree upon the majority of such forms quite as readily as they will upon the number of "species" that are to be recognized, it seems that the value of a work is impaired in which such an ultra-conservative attitude is maintained.

Mr. Loomis has always been an ardent student of bird migration and his numerous contributions to the subject are well known, so that one turns with especial interest to the chapter dealing with this fascinating problem in order to learn his present views. These we find rather disappointing inasmuch as he adheres closely to the old idea that "the young learn to migrate through the example of the adults," and "that the adults are guided by physical phenomena over areas that experience has rendered familiar." Dr. John B. Watson's well known experiments with Noddy and Sooty Terns are considered but the attempts to explain away the necessity for Dr. Watson's conclusion that the birds were able to find their way back to their nesting ground over waters hitherto unknown to them, are by no means convincing. As regards the "return" migration Mr. Loomis discounts the part that physiological incentive plays in starting the birds back to their summer homes with such astonishing regularity of

date, but he offers no adequate alternative reason. One point that he does emphasize however deserves careful consideration, i. e. that in judging whether the young or adult birds migrate first we are often basing our conclusions upon cases of arrested migration—young birds which have dropped out of the flight exhausted, and not upon the migratory flight itself. In the case of land birds however, the entire flight has to pause somewhere and we should at our stations of observation have just as good an opportunity of seeing one part of it as another.

These are big problems however, and are only incidentally connected with the main subject of Mr. Loomis's report which will take its place as one of the notable contributions to the natural history of a group of birds as baffling as they are fascinating. The key to their ultimate systematic arrangement will be found in the acquisition of adequate series of breeding birds from all of the scattered islets to which they resort to rear their young. Until we in a measure secure such material a reasonable conservatism in the description of new forms is perhaps the wisest course to pursue.

The half-tone plates, beside the portraits already referred to, consist of photographs of Albatrosses on the Galapagos Islands and of numerous skins illustrating variations in coloration of adults and young. There is a detailed map of the Galapagos Group and another of the oceans of the world.

A previous publication, No. VIII of this series, by Mr. E. W. Gifford, issued August 11, 1913, covered the other families of water birds and the doves obtained by the expedition. As we understand that Mr. Gifford is now engaged in other lines of work we fear that he may not contemplate completing his report on the remaining families contained in the collection. If not it is sincerely to be hoped that the authorities of the California Academy will arrange for their study by some one of the California ornithologists as material of such value to ornithology should be reported upon without further delay.—W. S.

Murphy on Atlantic Oceanites.¹—This is the second contribution by the same author from the Brewster-Sanford collection of sea birds in The American Museum of Natural History. Mr. Murphy's conclusions are based on a study of more than two hundred skins of the Wilson's Petrel in the collections in the American Museum (including those of Dr. Jonathan Dwight and Dr. L. C. Sanford), the Brooklyn Museum, and the Museum of Comparative Zoölogy. This wealth of material makes his conclusions correspondingly convincing. In the section on plumages and molts, it is shown that the juvenal plumage is recognizably different from that of the adult, and that the molt and growth of wing quills in the adult causes a seasonal variation in the wing measurement quite sufficient

¹ A Study of the Atlantic *Oceanites*. By Robert Cushman Murphy. Bull. Amer. Mus. Nat. Hist., Vol. XXXVIII, pp. 117-146, pls. I-III, March 26, 1918.

to account for the different races of this bird, which have been claimed for the Atlantic. The taxonomic status, migration, breeding, occurrence in summer near New York, and food are taken up separately and in detail; and the paper is not only a satisfactory review of the species but will be found useful for comparison in work on the less well known forms of petrels. It is illustrated with interesting and attractive photographs from life by the author and Mr. Howard H. Cleaves.—J. T. N.

Cory's 'Catalogue of Birds of the Americas.'¹—The great activity in the study of neotropical birds during the past few years has rendered all of our catalogues out of date, while the most recent one dealing with South American birds, that of Brabourne and Chubb, is disappointing to the general student from the fact that the Central American species are necessarily omitted. A work therefore, such as Mr. Cory has begun, which is both up to date and at the same time covers the entire New World, is particularly welcome at this time. Under each species and subspecies are given the original reference with the type locality and one or more additional references to important papers, including always the first reference to the name as adopted in the list. Then follows a brief statement of the range, and the number of specimens contained in the Field Museum Collection, with the localities which they represent. In the case of species not described in the 'British Museum Catalogue' or in Ridgway's 'Birds of North and Middle America,' a brief description is given in a footnote. As to the species recognized, the author is guided by the two works above mentioned and by such monographic papers as have appeared subsequently. Recently described forms not considered in such works are admitted pending future judgment. This plan seems to us an admirable one as it is not biased by the views of one individual which in such a work must needs be of very unequal value.

The classification follows that of Bowdler Sharpe's 'Hand List of Birds' and the present part covers the families from the Owls to the Humming-birds inclusive. This plan, of beginning the work with 'Part II' as the author explains, has been adopted with the idea of leaving to the last the families still to be treated by Ridgway in this 'Birds of North and Middle America' since the immediate treatment of these groups would have necessitated a very large number of footnote descriptions which can be avoided when reference to the above work is possible.

As in most works of this nature the author has found it necessary to propose a certain number of new forms. Of these we note the following: *Speotyto cunicularia minor* (p. 40); Boa Vista, Amazonia; *Aratinga cactorum perpallida* (p. 59), Ceara, Brazil; *Eupsittula pertinax margaritensis* (p. 63), Margarita Island; *Amazona amazonica tobagensis* (p. 83), Tobago;

¹ A Catalogue of Birds of the Americas. By Charles B. Cory. Part II, No. 1. Field Museum of Natural History, Publication 197. Zoölogical Series, Vol. XIII. Chicago, U. S. A., March, 1918. 8vo, pp. 1-315.

Urospatha martii olivacea (p. 108), Moyobamba, Peru; *Nephæcetes niger guadeloupensis* (p. 143); Guadeloupe Island; *Lepidopyga goudoti zuliae* (p. 182), Rio Aurare, W. Venezuela; *Colibri iolatus brevipennis* (p. 210), Caracas, Venezuela.

While we have not had an opportunity to test out the accuracy of the references they appear to have been carefully compiled and we have little doubt but that Mr. Cory's 'Catalogue' will prove to be an indispensable reference work to all who study neotropical bird-life. It is well printed, the type well selected and the arrangement clear and easily understood. Let us hope that nothing may hinder the appearance of the succeeding parts upon which Mr. Cory is now engaged.—W. S.

McAtee's 'Sketch of the Natural History of the District of Columbia.'¹—There is no more important point in connection with the study of local natural history than for the student to have a clear idea of the relation of the fauna and flora to the environment and to appreciate just where his immediate locality stands in the classification of the larger zoögeographic or phytogeographic areas as well as to know where to find the local literature. We often find admirable discussions of the faunal relations of the western states or of remote foreign countries, but concise accounts of the general features controlling the distribution of plants and animals in the neighborhood of the larger centers of population in the eastern states, are much harder to obtain. Such a work, therefore, as Mr. McAtee has conceived and carried to completion deserves the highest commendation, and should stimulate the preparation of similar sketches for other centers of natural history study.

The first half of the "sketch" consists of an historical account of natural history study in the vicinity of Washington with local bibliographies for the botany, insects, other invertebrates, fishes, reptiles and batrachians, birds, mammals and early history of man. The second part discusses the distribution of life in the region under the following heads: 'The Piedmont Plateau and Coastal Plain as Faunal and Floral Provinces'; 'Magnolia Bogs near Washington, D. C., and their Relations to the Pine Barrens'; 'Other Types of Collecting Grounds in the District of Columbia Region'; and 'The Upper Potomac Region.' Following this is the index to the accompanying map with a bibliography of maps, historical works, etc., from which the locality names were compiled. The bird portion consists of an interesting historical sketch and a list of fifteen papers.

This publication we notice is the first of a new series — 'Bulletins' — of the Biological Society which, if the present issue is a sample of what is to come, will be well worth while.—W. S.

¹ A Sketch of the Natural History of the District of Columbia together with an Indexed Edition of the U. S. Geological Survey's 1917 Map of Washington and Vicinity. By W. L. McAtee. Bull. Biological Society, Wash., No. 1. May, 1918. pp. 1-142 with map. (in folder). Price \$2.00, postpaid \$2.15.

Townsend's 'In Audubon's Labrador.'¹—Dr. Townsend has written so many interesting accounts of the life and natural history of the Labrador coast that we have come to associate his name instinctively with the wild, rugged north-land which he so delights to tell us about. To those who are familiar with his previous books the announcement of another volume will mean another treat in store for them. The volume in question however, has an added charm in the fact that the course of the writer on this trip followed that of Audubon on his famous voyage of 1833. Stops were made at the same points, the same localities were visited, the same birds were studied and in several instances descendants of the very people whom Audubon visited were met with.

The first chapter gives a brief resumé of Audubon's trip, with appropriate quotations from his diary and some account of the men who were associated with him. Then follows the narrative of the voyage of Dr. Townsend and his companion Mr. Harold St. John, the botanist, from Natashquan to Blanc Sablon, while two chapters on the conservation of wild life in Labrador, and on the protection of the Eider, the latter of which appeared originally in 'The Auk' for 1904, complete the main text of the volume. There is however an appendix consisting of letters from George C. Shattuck, Jr., who accompanied Audubon, from his father, from B. Lincoln, brother of another member of the party, and from Audubon himself, all of which relate to the famous expedition. Dr. Townsend's narrative is written in a delightful style giving one a vivid picture of the country and its inhabitants, while the pages teem with ornithological matter including many original observations on bird habits.

The illustrations are half-tone reproductions of photographs of localities, general scenery, birds and plants as well as portraits of many of the persons mentioned in the text. A map of the coast of Labrador with the routes of the two expeditions recalls to mind the comparatively small portion of the coast which Audubon visited, and the fact that it lay entirely on the southern side of the peninsula bordering on the Straits of Belle Isle and the Gulf of St. Lawrence. A good index completes this attractive volume.—W. S.

Pearson's 'Tales from Birdland.'²—With the constantly increasing interest in bird study there is a steady demand for bird books, not only for the advanced student, but for the little folks as well, and probably there is no better way to arouse a lasting interest in birds in the child than to tell him stories which are woven about the personality of some imaginary bird hero. As a contribution to this class of bird books Mr. Pearson has just

¹ *In Audubon's Labrador.* By Charles Wendell Townsend, M. D., with illustrations and a map. Boston and New York, Houghton Mifflin Company. 1918. pp. i-xii + 1-354. Price \$2.50 net.

² *Tales from Birdland.* By T. Gilbert Pearson. Illustrations by Charles Livingston Bull. Doubleday, Page & Company, 1918. pp. 1-237. Price 70 cts. postpaid.

published a little volume under the above title describing the experiences of 'Hardheart, the Gull'; 'Longtoe, the Gypsy Robin'; 'Jim Crow of Cow Heaven' and other similar celebrities, ten in all, into which he has managed to incorporate a great deal of valuable suggestion regarding bird protection without destroying the interest of the stories. The book should prove a valuable one both as a story book and for school reading.—W.S.

Mathews' 'Birds of Australia.'¹—This attractive number of Mr. Mathews' great work includes the Frogmouths, Rollers and part of the Kingfishers, groups which the author prefers to regard as distinct orders rather than as families of the Coraciiformes. We notice however that through inadvertence the order heading for the 'Coraciiformes' which should precede the account of the genus *Eurystomus* has been omitted so that this genus would appear to be included in the 'Podargiformes.'

The accounts of the life and habits of the Frogmouths are very interesting while the peculiar poses shown in the plates illustrate how much protective coloration and rigidity of posture figure in rendering them inconspicuous. We note the following new forms: *Podargus strigoides centralia* (p. 34), Central Australia; *P. s. capensis* (p. 35), Cape York; *Aegotheles cristata tasmanica* (p. 65), Tasmania; *A. c. olivei* (65), Cairns, N. Queensland; *A. c. centralia* (p. 67), Stevenson's River; *A. c. melvillensis* (p. 67), Melville Island; *Alcyone azurea wallaceana* (p. 94), Aru Isls.; *A. a. distincta* (p. 94), Humboldt Bay, New Guinea; and *Micralcyone pusilla yorki* (p. 103) Cape York.

In considering the Kingfishers five new genera are proposed as follows: *Cyanoceyx* (p. 96), type *Ceyx lepidus*; *Ceycalcyon* (p. 97), type *C. cyanopectus*; *Argyroceyx* (p. 97), type *C. argentata*; *Ispidella* (p. 97), type *Halcyon leucogaster* and *Ceycoides* (p. 98), type *C. madagascariensis*. The discussion on the relative value of color patterns and details of structure is interesting and the points brought out are well worthy of the attention of systematists. It might be mentioned in this connection that a similar discussion based largely upon the same group of species was published by the reviewer in 1912, in a paper which appears to have been overlooked by Mr. Mathews (Journal Acad. Nat. Sci. Phila., Vol. XV, pp. 313-319).—W. S.

Lincoln's 'The Woodpeckers of Colorado.'²—This little pamphlet is published by the Colorado Mountain Club and is intended to give to the layman concise information on the habits and appearance of the woodpeckers of the state. A preliminary sketch of the habits and structure of woodpeckers in general is followed by detailed accounts of the nine Colorado

¹ The Birds of Australia. By Gregory M. Mathews. Vol. VII, Part I, pp. 1-112. March 4, 1918.

² The Woodpeckers of Colorado. By F. C. Lincoln. Illustrated. Published by The Colorado Mountain Club. Publication No. 6. Denver, Colorado. December 8, 1917. pp. 1-22.

species. The illustrations consist of photographs of specimens and groups in the Colorado Museum of Natural History. A good plan for showing the actual and relative size of the species consists of a photograph of a series of skins, one of each species, arranged side by side on a sheet of paper ruled with horizontal lines one inch apart. The pamphlet is well printed and forms an attractive and useful publication.— W. S.

Cassinia for 1917.¹—The Delaware Valley Club's annual publication appears as usual in April covering the proceedings of the year 1917. The leading article is a biographical sketch of Samuel Wright, one of the active members of the Club who died early in the year, by Witmer Stone, with portrait. Then follows an admirable review of the summer bird-life of Pocono Lake, Pa., by John D. Carter; one of those boreal 'islets' in the mountainous part of the state which for many years past has been a favorite resort for several members of the Club. The nest of the Golden-crowned Kinglet found by Mr. Carter in 1916 was one of the latest discoveries, the first actual nesting record of this species for the state. Samuel Scoville, Jr., writes of the influx of Evening Grosbeaks which marked the winter of 1916-1917 and brought this species within the Philadelphia district for the first time. The usual migration report based upon the schedules of fifty-one observers, and the abstract of proceedings complete the number.

The average attendance at the sixteen meetings held during the year was twenty-one, notwithstanding the fact that twenty-two of the members are in the national service.— W. S.

Bangs and Penard on a Collection of Surinam Birds.²—This paper is based on a collection of 2000 skins representing 301 species which was made for the Museum of Comparative Zoölogy under the direction of Mr. A. P. Penard, of Paramaribo, the greater part of the specimens being obtained in the immediate vicinity of the city.

There is a brief introduction in which the physical features of Surinam are described, the country being divided into three parallel zones, the alluvial lowlands, the savanna lands and the highlands stretching back to the Tumuchumac Mountains of Brazil. Much of the last area is unexplored and according to the authors the extreme difficulties to be overcome make it unlikely that any extensive work will be done there for some time to come.

Under many of the species there is a mere mention of the specimens contained in the collection while under others there is considerable dis-

¹ Cassinia: A Bird Annual. Proceedings of the Delaware Valley Ornithological Club of Philadelphia. 1917 (issued April, 1918). pp. 1-74. Price 50 cents. Address care of The Academy of Natural Sciences, Philadelphia.

² Notes on a Collection of Surinam Birds. By Outram Bangs and Thomas E. Penard. Bull. Mus. Comp. Zool., Vol. LXII, No. 2. April, 1918. pp. 25-93.

cussion of relationships and nomenclature, and incidentally comment is made upon various species from other parts of South and Central America. Five new forms are described from Surinam and thirteen from other places—Panama, Mexico, St. Vincent, Trinidad, etc., while two new genera are erected; *Helicolestes* for *Falco hamatus*, and *Hypocnemoides* for *Hypocnemis melanopogon*. Thirteen names not in current use have been revived and recognized.

The paper is a valuable contribution to the ornithology of a region upon which comparatively little has been written in late years.—W. S.

Riley on a New Bullfinch from China.¹—A single specimen of a Bullfinch from Peking recently presented by Mr. Geo. D. Wilder to the U. S. National Museum proves to belong to an undescribed race allied to *Pyrhula erythraca* from Sikkim but widely separated geographically. Mr. Riley names it in honor of its discoverer, *P. e. wilderi*.—W. S.

McGregor on New or Noteworthy Philippine Birds.²—This contribution consists of notes on twenty-two species of birds Philippine, including an additional record of the Monkey-eating Eagle, *Pithecophaga jeffreyi*, an account of a living specimen of *Leucotreron merrilli* with a colored plate. For this species the new subgeneric name *Ncoleucotreron*, (p. 2) is proposed. The other notes deal mainly with terns, shore-birds and swifts.—W. S.

Gabrielson on the Birds of Clay and O'Brien Counties, Iowa.³—This list of 136 species is the result of a number of field trips during several years prior to 1912. It is not presented with any idea of its being complete but mainly because conditions in the last few years have so altered the region that any record becomes of great interest. Extensive draining, the author tells us has destroyed almost all the swamps and ponds, and he goes on to say: "Where in 1909 and 1910 cat tails and other aquatic vegetation, teeming with bird life, flourished, solid fields of corn now stand and the birds have vanished." Unfortunately this is not the only spot where such changes are going on and he who saves for posterity some record of the original faunal conditions deserves the highest commendation.—W. S.

Recent Papers on Bird Preservation.—The Annual Report of the State Ornithologist of Massachusetts⁴ is as usual full of interesting matter to the conservationist. We learn with regret of the depletion of the Heath

¹ A New Bullfinch from China. By J. H. Riley. Proc. Biol. Soc. Wash., Vol. 31, pp. 33-34. May 16, 1918.

² New or Noteworthy Philippine Birds, II. By Richard C. McGregor. Philippine Jour. of Science, D. Vol. XIII, No. 1, pp. 1-19. January, 1891.

³ A List of the Birds of Clay and O'Brien Counties, Iowa. By Ira N. Gabrielson. Proc. Iowa Acad. of Sciences, Vol. XXIV, 1917. pp. 259-272.

⁴ Tenth Annual Report of the State Ornithologist of Massachusetts. By E. H. Forbush. pp. 1-27. 1918.

Hen colony on Martha's Vineyard by fires which swept the island in May 1916. Starlings come in for a good deal of attention and in connection with the roosting of this species and the Blackbirds in shade trees, which habit often proves a nuisance, a novel method is described for driving them away. A heavy pad is fastened to the trunk of a tree which is then struck several times with a large sledge hammer. By repeating this for several nights the birds become discouraged and leave.

Mr. W. S. Taylor¹ has prepared a bulletin on the Bobwhite in Texas, which however, is much broader than its title would imply, being an admirable plea for the protection of game in the state, with information regarding bird conservation work in the schools and lists of publications available for study.

The U. S. Biological Survey has issued two pamphlets recently, one by the late Prof. Beal² dealing with the food habits of the swallows which follows the plan of other similar publications issued by the Survey. The large numbers of dragonflies eaten by the Purple Martin leads the author to think that the birds must search especially for them. As a matter of fact along the coast of New Jersey where the Martins nest regularly they forage naturally over the great expanse of salt marshes where dragonflies abound, and it would seem difficult for the birds to avoid catching them. The other paper referred to is by Dr. Oberholser³ on the breeding grounds of the water fowl on the Great Plains. This is a plea for the protection of the few suitable breeding grounds still remaining for these birds if we would save them from extermination. The Sand-Hill Region of Nebraska and the Lake Region of the Dakotas are especially considered as offering ideal conditions.

The admirable 'Biennial Report of the Department of Conservation of Louisiana',⁴ contains the reports of E. A. Mellhenny, Superintendent of the State Game Farm and of S. C. Arthur, State Ornithologist which are full of valuable information. The fact that Night Herons, or 'gros becs' as they are locally termed, are regarded as legitimate game in the state and form an important item of food for the residents of many of the bayous will be news to most persons outside the boundaries of Louisiana.

Wallace Craig⁵ has recently prepared a valuable series of directions for making a wire bird cage which will be welcome to many who have temporary use for some sort of receptacle in which live birds may be kept safely.—W. S.

¹ The Bobwhite. By W. S. Taylor. Univ. of Texas Bulletin, No. 1748. August, 1917.

² Food Habits of the Swallows. By F. E. L. Beal. U. S. Dept. of Agriculture, Bull. 619. March 8, 1918. pp. 1-28.

³ The Great Plains Waterfowl Breeding Grounds and their Protection. By Harry C. Oberholser. Yearbook of the Dept. of Agriculture 1917. Separate from the No. 723, pp. 1-10.

⁴ Biennial Report of the Department of Conservation State of Louisiana from April 1, 1916 to April 1, 1918. pp. 1-180. M. L. Alexander, Commissioner.

⁵ Directions for Making a Metal Bird-Cage. By Wallace Craig. Reprint from The Avicultural Magazine. August, 1917, pp. 1-6.

Bird Enemies of Brine Shrimps and Alkali Flies.—Sweeping statements based on negative evidence are dangerous, and no exception may be noted for one which claims that "enemies play no part in keeping down the numbers of *Artemia* (Brine Shrimps), or of *Ephydra* (Alkali Flies) in the larval stage."¹ Dr. Alex. Wetmore, of the Biological Survey, who has had considerable experience about Great Salt Lake to which locality the quoted assertion relates, has pointed out² that *Artemia* and *Ephydra* are by no means free from enemies. Shovellers, Lesser Scaups, Golden-eyes, Green-winged Teal, Wilson's and Northern Phalaropes, Avocets and Black-necked Stilts all feed extensively upon both of these animals. But for the fact that stomach analyses have not been made of other birds collected at the same place, it would undoubtedly be possible to add the names of a number of species to this list. Dr. Wetmore states that "the toll taken by birds from the brine shrimp and alkali fly larvæ and pupæ during the course of a season constitutes a mass of individuals almost beyond comprehension. . . . The immense number of these creatures . . . must be attributed to the large number of offspring produced rather than to an absence of enemies."

If misinformation and mis-statements based thereon, are as prevalent throughout biological science, as they are in the field that has been most cultivated by the reviewer,—the food-habits of birds—the way of the student toward truth is indeed beset with pitfalls and obstacles, almost impassable.—W. L. M.

Bird Enemies of the Varying Hare.—Mr. Norman Criddle in connection with an account of the destructiveness of snowshoe or bush rabbits, points out the value of their bird enemies. He states: "Three birds are prominent in the destruction of rabbits. The Goshawk which is also very destructive to grouse; both eagles are largely rabbit feeders, and lastly there are the Great Horned Owls. These owls have unfortunately been reduced much by man of late years, though there are no birds that take a heavier toll of bush rabbits. Preserve these birds and we should in time reduce rabbits very materially and by this means at least aid in conserving our forests."³ (p. 262.)

To the birds named by Criddle as enemies of bush rabbits must be added the Great Gray Owl and the Snowy Owl. Mr. E. A. Preble reported⁴ that the stomachs of the latter species collected by him almost invariably contained the remains of varying hares.—W. L. M.

Curious Hoarding Habits of Birds.—Dr. L. O. Howard reports⁵ the recovery of moonstones, kernels of corn and wheat, and small acorns

¹ Vorhies, Chas. T. "Notes on the Fauna of Great Salt Lake. Amer. Nat. 51. p. 498. August, 1917.

² Amer. Nat. 51, pp. 753-755. December, 1917.

³ Varying hares of the prairie provinces. Agr. Gaz. Canada, Vol. 4. No. 41. April 1917.

⁴ N. A. Fauna, 27, 1908, p. 375.

⁵ Entomological News, 29, No. 1, January, 1918, pp. 15-16.

from cocoons of Emperor moths (*Samia cecropia*). The probability is that these objects are placed in the cocoons by birds addicted to hoarding. No very definite observations on the agents have been made, the most satisfactory being those of Dr. Alex. Wetmore of the Biological Survey who has seen Bluejays stuff grains of corn and small acorns into large cocoons.—W. L. M.

Bird Enemies of Tree Hoppers (Membracidæ).—In an admirable paper on the 'Biology of the Membracidæ of the Cayuga Lake Basin,'¹ Dr. W. D. Funkhouser discusses the relations of birds to these insects. He presents records of seven definitely named species of birds feeding on tree hoppers, in addition to warblers (various species) and thrushes (various species), which we wish were particularized.

The greatest interest in connection with the records relates to the alleged protective adaptations of Membracids. Dr. Funkhouser states:

"Very few of the local species are molested by birds. A few species of birds have been observed feeding on the nymphs but usually neglecting the adults, the latter being probably sufficiently protected from bird enemies by the hard pronotum and sharp processes. Various species of adult membracids have been thrown to birds in captivity; in general these have been refused but in a few cases they have been picked up only to be dropped again. Evidently the strong pronotal processes, which are often sharp and hard enough to pierce the skin if the insect is seized suddenly, are unpalatable and irritating." (pp. 416-7).

In these remarks Dr. Funkhouser evidently has fallen, probably unconsciously, into the habit of speculation, which selectionist doctrine has almost ingrained in biologists and especially in biological teaching. That Dr. Funkhouser does not accept these views at face value is shown by the following further quotation from his paper: "Poulton * * * has called attention to the fact that it is hard to deny the theory of protective resemblance when the same object is accomplished by both the nymph and the adult but in different ways. In the case of the local forms mentioned above, the nymph imitates the uncurling leaf or the irregular bark by spines on both thorax and abdomen — chiefly the latter — while the adult imitates an entirely different part of the plant by the development of an entirely different part of the body. On the other hand, some of the commonest of the local species of Membracidæ in no respect seem to resemble any part of the host on which they live, although their shapes are decidedly peculiar. The high dorsal crest of the *Telamonas*, for example, can only by a stretch of the imagination be made to resemble any peculiarity of the oak twig on which the insects rest, and in fact they are very conspicuous on their host. Likewise the *Ceresas*, perhaps the most widely distributed genus in the basin, are plainly seen when in their natural surroundings, and the two prominent suprahumeral horns do not in the least resemble plant structures with which the insects are associated. The answer of

¹ Mem. 11, Cornell Univ. Agr. Exp. Sta. June, 1917.

the natural selectionist might be that at some previous time such adaptation had held, and this of course is unanswerable since we have no way of knowing what host plants may have been the home of the insects in bygone periods; but it is interesting to note that the genera *Ceresa* and *Telamona*, which now show little protective resemblance to parts of their hosts, are more numerous and apparently maintain an existence with greater ease than do those species that show very excellent protective resemblances.

"It is unnecessary to take up separately each of the local forms in this respect. For each it is possible to suggest an explanation, reasonable or otherwise according to the degree of imagination possessed. But in general it must be said for the local forms, as for the family as a whole, that such speculation merely lies in the realm of conjecture." (pp. 419-20).

The realm of conjecture is a vast domain, illimitable in fact, otherwise we should have, under the necessity of inventing a new infinity, to accommodate the unrestrained theorizing of the selectionists. Contact with the hard facts of what adaptations do and do not accomplish invariably removes the young and plastic naturalist from the thrall of protective adaptation doctrine. The reviewer has watched the course of this process in a number of cases of men beginning the work of analyzing the contents of bird stomachs. First, surprise is manifested that birds should eat things that college teaching has pronounced protected, then as other cases occur from time to time the old belief is entirely cast aside, and finally long experience leads to the conclusion that in their respective ecological niches birds feed practically indiscriminately.

To return to the Membracids, we must conclude that their protective adaptations have no especial significance in foiling predators. In Biological Survey investigations tree hoppers have been found in the stomachs of more than 120 species of birds, and in numbers up to 26 individuals in a single stomach. They have been found in 15 or more stomachs of each of the following species: Great-crested and Ash-throated Flycatchers, Meadow-lark, Brewer's Blackbird, Bullock's Oriole, English Sparrow, Cliff Swallow, Red-eyed, Solitary and Warbling Vireos, Bush-tit, and Ruby-crowned Kinglet. The tree hoppers identified belong to 21 different genera indicating that no partiality is shown. Membracids with the most prominent horns and spines of any in our fauna, as those of the genera *Campylenchia*, *Platycotis*, *Ceresa* and *Platycentrus* are taken with the rest.—W. L. M.

The Ornithological Journals.

Bird-Lore. XX, No. 2. March-April, 1918.

Some Notes on Martin Colonies. Five contributions from as many writers.

Notes on the Tree Swallow. By Verdi Burtch.

The Song Sparrow. A Poem by Edw. J. Sawyer.

How to Make and Erect Bird-Houses. By Hubert Prescott.

Photography of Feeding Stations. By C. Breder, Jr.

Holbøll's Grebe in Connecticut. By Wilbur F. Smith.

The Migration of certain Tanagers and Swallows is considered by Dr. Oberholser while Dr. Chapman treats of the plumages of the former, with a colored plate by Fuertes.

The Educational Leaflet describes the Raven.

Bird-Lore. XX, No. 3. May-June, 1918.

Three Years After. By Mable Osgood Wright.—An extremely interesting report on the condition of the Connecticut Audubon Society's 'Birdcraft Sanctuary.' During the season of 1917 there were 102 nests built on the grounds, belonging to 24 species. It was found necessary to destroy the English Sparrows, Starlings, Crows and Purple Grackles which visited the sanctuary. Traps with padded jaws were set for hawks, and all harmless species as well as owls were liberated. Northern Shrikes were found to be a serious menace to winter birds and striped snakes to nesting sparrows. The most serious enemy to the birds was the domestic cat, 107 of which were caught.

The Whip-poor-will. By Melicent E. Numason. A good account of its breeding.

My Nuthatch Tenants and a Pair of Red-headed Ruffians. By R. W. Williams.

The Waxwings and Phainopepla are treated in the usual papers on migration and plumage, with an excellent color plate by Fuertes.

The Condor. XX, No. 2. March-April, 1918.

In Memoriam: Lyman Belding. By Walter K. Fisher.

The Salt Marsh Yellowthroats of San Francisco. By George W. Schussler.

A Return to the Dakota Lake Region. By Florence M. Bailey.

Six Weeks in the High Sierras in Nesting Time. By Milton S. Ray.

The Scarlet Ibis in Texas. By R. A. Sell.—The unearthing of this important record was in part the result of criticism of a supposed sight record published in 'The Condor,' Vol. XIX, p. 46.

Both in this case and in that of the supposed Harpy Eagle published recently in 'The Auk' it would seem that the best way to treat a doubtful record is to give it publicity in some reliable journal and someone will make it his business to supply the information that is lacking!

The Subspecies of the Oregon Jay. By H. S. Swarth.

Bird Notes from Forrester Island, Alaska. By George Willett.

Seven New or Noteworthy Birds from East Central California. By Joseph Grinnell.—Two forms are described as new; *Sitta carolinensis tenuissima* (p. 88) from the Panamint Mountains and *Hylocichla guttata polionota* (p. 89), from the White Mountains.

The Condor. XX, No. 3. May-June, 1918.

The Short-eared Owl in Saskatchewan. By Walter A. Goelitz.

Notes on the Nesting of the White-throated Swift in Colorado. By W. C. Bradbury.—An excellent account with numerous photographs of habitat, etc.

A Return to the Dakota Lake Region. By Florence M. Bailey.—Birds of the Unbroken Prairie.

Costa's Hummingbird — Its Type Locality, Early History and Name. By T. S. Palmer.—A valuable historical article showing that the type must have been taken at Magdalena Bay, Lower California.

The Distribution of the Subspecies of the Brown Towhee (*Pipilo crissalis*). By H. S. Swarth. A valuable resume.

The Wilson Bulletin. Vol. XXX, No. 1. March, 1918.

A Strange Case of Hybridism. By F. C. Lincoln.—Prairie Chicken and Sharp-tailed Grouse. The author will find two similar hybrids described in early volumes of the 'Nuttall Bulletin' and 'The Auk.'

Birds Observed near Minco, Central Oklahoma. By Alexander Wetmore.

Louisiana Bird Refuges. By Alfred M. Bailey.

Harris Hawks in Ohio. By Thomas M. Earle.

The Oologist. XXXV, No. 6. June, 1918.

Notes on Birds Observed at and near St. Teresa, James Island, Florida, in the Summer of 1901. By R. W. Williams.—An annotated list of 59 species.

Observations of Swainson's Warbler. By A. J. Kirn.—Breeding at Copan, Washington Co., Oklahoma.

The Ibis. X Series, VI, No. 2. April, 1918.

On Birds Recently Collected in Siam. Part II. Passeres. By C. Boden Kloss. Concluded.—The following are described as new: *Volvocivora koratensis* (p. 193) East Siam; *Chloropsis aurifrons inornatus* (p. 198), East Siam; *Otocompsa flaviventris minor* (p. 200) S. W. Siam; *Mixornis rubricapilla connectens* (p. 206); Lat. 10 N., Siam; *Dicaeum cruentatum siamensis* (p. 216), E. Siam; *Chalcoparia singalensis koratensis* (p. 218) E. Siam; *Dicrurus annectens siamensis* (p. 226); Koh Lak, S. W. Siam.

Some Additions and Corrections to the B. O. U. List of British Birds. By the Committee.

A Note on the Structure of the Feather. By John S. Gladstone.—Structure of the 'tegmen' or ventral ridge of the feather ramus.

The Birds of the Isle of May: A Migration Study. By Evelyn V. Baxter and Leonora J. Rintoul.—Valuable data on the relation of migration to winds, and full list of species observed.

Notes on Some Birds of the Bessarabian Steppe. By Maud D. Haviland.

Further Notes on the Birds of Macedonia. By Alexander G. L. Sladen.

Bulletin of the British Ornithologists' Club. CCXXXI. March 4, 1918.

Mr. W. L. Selater described the following: *Milvago chimango temucoensis* (p. 43), Palal, South Chile; *Micrastur plumbeus* (p. 44), Carondelet, Esmeraldas, Ecuador; and *Geranospiza niger balzarensis* (p. 45), Balzar Mts., Ecuador.

Mr. Charles Chubb described the following: *Grallaria punensis* (p. 47), South Peru; *Corythopsis torquata sarayacuensis* (p. 48), Sarayacu, Ecuador; *Aramides cajanea salmoni* (p. 48), Antioquia, Colombia.

Mr. G. M. Mathews described: *Pomatostomus ruficeps parsonsi* (p. 48), Pungonda, S. Australia.

Bulletin of the British Ornithologists' Club. CCXXXII. April 2, 1918.

Mr. P. F. Bunyard described the eggs and down of *Nyroca nyroca*.

Mr. Charles Chubb described as new: *Planesticus fredericki* (p. 53), Bartica, British Guiana; *P. fumigatus abariensis* (p. 53), Abary River, British Guiana and *P. f. ochro-fulvescens* (p. 54), Trinidad.

Bulletin of the British Ornithologists' Club. CCXXXIII. April 30, 1918.

Dr. Hartert described five new subspecies of *Rhipidura* and an Oriole, *O. luteolus thaiaceus* (p. 63), the latter from Siam.

S. Clark described a new Pigeon from British Somaliland, *Columba oliviae* (p. 61).

E. C. Stuart Baker described *Garrulax moniliger fuscata* (p. 64), Tavoy, Burma; *Graucalus macei siamensis* (p. 69), Siam, and *Aethiopsar fuscus infuscatus* (p. 70), Lower Chindwin.

British Birds. XI, No. 10. March, 1918.

Notes on the Kingfisher (*Alcedo ispida ispida*). By W. Rowan.

A Note on the Nesting of the Swallow. By J. H. Owen—Important notes on the appearance and development of the young, nestling period etc.

The Moults and Sequence of Plumages of the British Waders. By Annie C. Jackson.—The Knot and Dunlin.

British Birds. XI, No. 11. April, 1918.

Field Notes on the Marsh Warbler. By Lieut. D. H. Meares—With colored plate.

Ornithological Notes from Norfolk for 1917. By J. H. Gurney.

British Birds. XI, No. 12. May, 1918.

The Effect of the Winter of 1916-1917 on Our Resident Birds. By F. R. C. Jourdain.

The "British Birds" Marking Scheme. Progress for 1917. By H. F. Witherby.

Avicultural Magazine. IX, No. 4. February, 1918.

The White Pelicans of Oregon. By Mrs. C. E. Maud.—On Klamath Lake.

Some American Quails. By P. A. Pichot.—Scaled and Massena Quails and Bobwhite in captivity.

The Breeding of the Mexican Black-breasted Quail (*Colinus pectoralis*). By W. S. Baily.

Birds of the Gambia. By E. Hopkinson.

The Pigeon Hollandais. By Graham Renshaw.—An account of the known specimens of the extinct *Alectroenas nitidissima*.

The Emu. XVII, Part 4. April, 1918.

Notes on North-western Birds. By F. L. Whitlock.

Ornithological Notes from North Queensland. By Dr. W. Macgillivray. Part III.—Concludes this valuable annotated list.

Alike in Difference. By E. J. Banfield.— Migration notes on the Nutmeg Pigeon and Metallic Starling.

Further Notes on Cormorants, their Food, Temperatures &c. By Capt. S. A. White.

The Ground Parrot (*Pezoporus formosus*). By A. H. E. Mattingley.

Notes on Some of the Birds met with in the Neighborhood of Pungonda. By E. Ashby.

Revue Francaise d'Ornithologie. No. 105. January, 1918. [In French].

On a Small Collection of Birds from French West Africa. By A. Mene-gaux.

Revue Francaise d'Ornithologie. No. 107. March, 1918.

The Embryonic Life of the Ostrich. By M. Aubry.— Illustrated.

On *Rhamphocorys clot-bey*. By P. Bede.

Ardea. VI, Nos. 3-4. December, 1917. [In Dutch.]

Ornithological Observations in Holland. By E. D. Van Oort.

Results of Bird-ringing at the Leyden Museum. By E. D. Van Oort.

El Hornero. I, No. 1. October, 1917. [In Spanish.]

The Ornithological Society of La Plata.

The Swifts of the Republic of Argentina. By R. Dabbene.

Some Birds of Puerto Deseado, Patagonia. By M. Doello-Jurado.

Formation of the 'Gabinete del Rey' in 1769. By Felix F. Outes.

Ornithological Reflections. By Manuel Selva.— On classification according to habitat.

Some Notes on a Collection of Birds from the Island of Martin Garcia. By R. Dabbene.

Ornithological Articles in Other Journals.¹

MacMillan, Donald B. Food Supply of the Smith Sound Eskimos. (Amer. Mus. Journal March, 1918.) — Data on the use of birds and eggs.

Roosevelt, Theodore. Common Sense and Animal Coloration. (*Ibid.*)

Lang, Herbert and **Chapin**, James P. Nesting Habits of the African Hornbill. (*Ibid.*, April, 1918.) — An interesting account with illustrations.

Forbush, Edward H. The Heath Hen of Martha's Vineyard. (*Ibid.*) — Illustrated with photographs by George W. Field.

Vreeland, Frederick K. How a Ruffed Grouse Drums. (Bull. Amer. Game Protective Asso., January, 1918.) — An excellent series of photographs of the bird 'in action.'

¹ Some of these journals are received in exchange, others are examined in the library of the Academy of Natural Sciences of Philadelphia. The Editor is under obligations to Mr. J. A. G. Rehn for a list of ornithological articles contained in the accessions to the library from week to week.

Munro, J. A. Notes on the Birds in an Okanagan Orchard. (Ottawa Naturalist, January, 1918.)

McWilliam, J. M. Notes on Some of the Birds of Bute (Scotland). (Scottish Naturalist, February, 1918.)

Evans, William. References to the Early Bird-Life of the Isle of May. (*Ibid.*, March, 1918.)

Oberholser, H. C. List of the Birds Observed at Swan Lake, Minnesota, July 25-27, 1917. (Fins, Feathers and Fur, No. 13, March, 1918.)

Oberholser, H. C. Mutanda Ornithologica III. (Proc. Biol. Soc. Wash. XXXI, May 16, 1918.) — Several changes in names preoccupied viz. *Hæmatopus quoyi* Brab. & Chubb becomes *H. townsendi* Aud.; *Totanus fuscus* Linn. becomes *T. maculatus* (Tunstall); *Eos reciniata* (Bechst.) becomes *E. guenbyensis* (Scop.); *Leucotreron gularis* Q. & G. becomes *L. epia* (p. 48) nom. nov. and *Gymnopolia erythrothorax* (Meyen.) becomes *G. cecilioe* (Less.).

Grinnell, Joseph. The Subspecies of the Mountain Chickadee. (Univ. of Cal. Publ. Zool. XVII, No. 17, May 4, 1918). Besides the typical form of the Rocky Mts., Dr. Grinnell recognizes three others: *Penthestes g. inyoensis* (p. 509), Panamint Mts., eastern California; *P. g. baileyi*, Mountains of southern California and *P. g. abbreviatus* (p. 510), Siskiyou Mountains, northern California.

Foster, Arthur H. A List of Birds which have occurred in North Hertfordshire, with Notes on each Species. (Trans. Hertfordshire Nat. Hist. Soc. and Field Club, XVI) — An excellent British 'local list.'

Coward, T. A. Observations on the Nesting of the Palm Swift, made by Arthur Loveridge in German East Africa. (Proc. Manchester Lit. and Philos. Soc., 1916-1917.)

Gudger, E. W. An Old Record of Albino Turkey Buzzards. (Science, No. 1213.)

Oberholser, H. C. Albino Turkey Buzzards. (Science, No. 1221). — Explains that the supposed albinos were in all probability King Vultures.

Publications Received.—**Bangs,** Outram and Penard, Thomas E. Notes on a Collection of Surinam Birds. (Bull. Mus. Comp. Zool., LXII, No. 2, pp. 25-92, April, 1918.)

Beal, F. E. L. Food Habits of the Swallows. A Family of Valuable Native Birds. Bull. No. 619, U. S. Dept. Agriculture, March 8, 1918, pp. 1-28.

Chubb, Charles. Notes on *Embernagra platensis* and its Allies, with Description of a New Species. (The Ibis, January, 1918, pp. 1-10.)

Craig, Wallace. Directions for Making a Metal Bird-Cage. (Avicultural Magazine, August, 1917. Repaged 1-6.)

Cory, Charles B. Catalogue of Birds of the Americas, Part II, No. 1. Field Mus. of Nat. Hist., Publ. 197, Zool. Series. Vol. XIII, March, 1918, pp. 1-315.

Forbush, Edw. H. (1) The Heath Hen of Martha's Vineyard. (Amer. Museum Jour., Vol. XVIII, No. 4, pp. 278-285, 1918.) (2) Tenth Annual

Report of the State Ornithologist [of Massachusetts] for the Year 1917, pp. 1-27, December, 1917.

Gabrielson, I. N. A List of the Birds Observed in Clay and O'Brien Counties, Iowa. (Proc. Iowa Acad. Sci., Vol. XXIV, 1917, pp. 259-272.)

Lincoln, F. C. The Woodpeckers of Colorado. Publ. No. 6, The Colorado Mountain Club, Denver, Colo., December 8, 1917, pp. 1-22.)

Loomis, L. M. A Review of the Albatrosses, Petrels, and Diving Petrels. Publ. No. XII, Exped. of the California Acad. of Sciences to the Galapagos Islands, 1905-1906. Proc. Cal. Acad., Fourth Series, Vol. II, Part II, No. 12, pp. 1-187, pls. 1-17, April, 1918.

Mathews, G. M. The Birds of Australia. Vol. VII, Part I, March 4, 1918, pp. 1-112.

McAtee, W. L. A Sketch of the Natural History of the District of Columbia, together with an Indexed Edition of the U. S. Geological Survey's 1917 Map of Washington and Vicinity. Bull. Biol. Soc. Wash., No. 1, May, 1918, pp. 1-142. \$2.00, post paid, \$2.15.

McGregor, R. C. New or Noteworthy Philippine Birds. II. (Phil. Jour. Sci., Vol. XIII, No. 1, Sec. D, January, 1918, pp. 1-19, pls. 1-3.)

Murphy, R. C. A Study of the Atlantic Oceanites. (Bull. Amer. Mus. Nat. Hist., XXXVIII, Art. IV, pp. 117-146, March 26, 1918.)

Oberholser, H. C. The Great Plains Waterfowl Breeding Grounds and their Protection. (Yearbook U. S. Dept. Agric., 1917. Repaged, 1-10.)

Pearson, T. G. Tales from Birdland. 12 mo. Doubleday, Page & Company, 1918. pp. 1-237. 70 cts., postpaid.

Riley, J. H. A New Bullfinch from China. (Proc. Biol. Soc. Wash., Vol. 31, pp. 33-34, May 16, 1918.)

Shufeldt, R. W. Anomalies of the Animal World. Part VIII. (Scient. Amer. Suppl., No. 2202, March 16, 1918.)

Taylor, W. S. The Bobwhite. Bull. 1748, Univ. Texas, August 25, 1917, pp. 1-26.

Townsend, C. W. In Audubon's Labrador. Small 8vo, pp. 1-354. Houghton, Mifflin Company. \$2.50 net.

American Museum Journal, XVIII, Nos. 3 and 4, March and April, 1918.

Ardea, Vol. VI, No. 3-4.

Avicultural Magazine, (3), IX, Nos. 5, 6, and 7, March-May, 1918.

Biennial Report of the Department of Conservation [of Louisiana] from April 1, 1916 to April 1, 1918.

Bluebird, X, No. 5, April, 1918.

Bird-Lore, XX, Nos. 2, and 3, March-April and May-June, 1918.

Bird Notes and News. VIII, No. 1, Spring, 1918.

British Birds, XI, Nos. 10, 11 and 12, March-May, 1918.

Bulletin British Ornithologists' Club, Nos. CCXXXI, CCXXXII, and CCXXXIII. March 4, April 2 and 30, 1918.

Bulletin American Game Protective Association, Vol. 7, Nos. 1 and 2, January and April, 1918.

- Bulletin** Charleston Museum, XIV, Nos. 3 and 5, March-May, 1918.
California Fish and Game, Vol. 4, No. 2, April, 1918.
Cassinia, Proc. Delaware Valley Ornithological Club, 1917.
Condor, The, XX, Nos. 2, and 3, March-April, May-June, 1918.
Current Items of Interest, No. 35, February 21, 1918.
El Hornero, Revista de la Sociedad Ornitológica del Plata, Tomo 1, No. 1, October, 1917.
Emu, The, XVII, Part 4, April, 1918.
Fins Feathers and Fur, No. 13, March, 1918.
Ibis, The, (10), VI, No. 2, April, 1918.
New Jersey Audubon Bulletin, Nos. 24 and 25, March and May, 1918.
Oologist, The, XXXV, Nos. 4 and 5 and 6, April-June, 1918.
Ottawa Naturalist, The, XXXI, Nos. 10 and 11, January and February, 1918.
Philippine Journal of Science, The, XII, Sect. D., Nos. 6, XIII, Nos. 1, 2, and 3, November, 1917, January, March and May, 1918. Contents and Index.
Revue Française d'Ornithologie, Nos. 106 and 107, February and March, 1918.
Royal Society for the Protection of Birds, Twenty-seventh Annual Report.
Science, N. S., Nos. 1211-24.
Scottish Naturalist, The, Nos. 74, 75 76, and 77, February-May, 1918.
Wilson Bulletin, The, XXX, No. 1, March, 1918.
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NOTES AND NEWS.

WE learn from 'The Ibis' of the death, on January 31, 1917, of Prof. Dr. Friedrich Hermann Otto Finsch, an original Honorary Fellow of the American Ornithologists' Union. He was born at Warmbrunn in Silesia on October 8, 1839 and published his first contribution to ornithology in 1859.

In 1861 he obtained a position in the Leyden Museum under Schlegel and in 1864 succeeded Hartlaub as curator of the Museum at Bremen. In collaboration with Hartlaub he published two notable ornithological works, 'The Ornithology of Central Polynesia' and 'Die Vogel Ost-Afrikas.' Resigning his position at Bremen in 1878 he engaged in an extensive tour of the South Seas which covered the years 1879-1882. Besides securing extensive and valuable collections he gained an intimate knowledge of the islands with the result that he returned on another expedition in 1884-1886 as Imperial Commissioner and through his influence

the German Colonies of Kaiser Wilhelm's Land and the Bismark Archipelago were established.

Returning to Leyden as the curator of the Rijk Museum in 1898 he continued his ornithological researches for some years but in 1904 he was appointed curator of the Ethnographic Section of the Museum at Brunswick, Germany, where he remained for the rest of his life, devoting his attention almost entirely to ethnology.

Dr. Finsch was well known in England and published contributions in 'The Ibis' and other British journals as early as 1870. In 1872 he visited California and a few years later travelled in Lapland and in Siberia.

His ornithological work was entirely systematic and consisted besides the volumes already mentioned, of numerous contributions to the 'Journal für Ornithologie,' the 'Ned Tijdschrift Dierkunde,' and other journals. As has been truly said "he was one of the best of the old school of German workers."

HENRY REED TAYLOR, well known as the founder of the 'Nidologist,' died at Agnew, Calif., Sept. 23, 1917. He was the son of Bishop William Taylor of the Methodist Episcopal Church and Isabella A. (Kimberlin) Taylor, both of whom were born in Virginia. Harry R. Taylor as he was generally known was born at Capetown, South Africa, Oct. 6, 1866, but spent most of his life at Alameda, Calif. He was an enthusiastic oologist and published many articles on nests and eggs of western birds especially Raptores and Hummingbirds. During the period of his ornithological activity, from 1884 to 1906, his field of work was confined to California and included chiefly the counties of Alameda, Monterey, Placer, San Benito and Santa Clara, and the Farallone Islands. His contributions were published chiefly in the 'Young Oologist,' 'Ornithologist and Oologist,' 'Nidologist' and 'Condor.' From 1893 to 1897 he edited the 'Nidologist' which was then the organ of the Cooper Ornithological Club. One of his latest publications, issued in 1904, was his 'Standard American Egg Catalogue,' which included an appendix containing a directory of oologists. Shortly after the great earthquake of 1906 he became a patient in a sanatorium where he passed the last eleven years of his life.

Taylor was one of the founders and vice president of the California Ornithological Club in 1889, and vice president in 1894 and president in 1895 of the Cooper Ornithological Club. Although he never joined the American Ornithologists' Union, he was known to a number of the members, attended the Washington meeting in 1895, and published the first group photograph of the Union (Nidologist, III, p. 41, Dec., 1895). He was active, energetic, always enthusiastic in any matter pertaining to oology, and was one of the most prominent of the little group of California field collectors of the eighties.—T. S. P.

THE PRINCIPAL ORNITHOLOGICAL SOCIETIES.—The following list of societies is given for the convenience of readers who may be interested

in the organizations which have been founded for the advancement of ornithology. The name of each society is followed by the date of organization, the name of its publication, and the address of the secretary or other officer to whom communications should be sent.

As this list is intended only for present addresses, it is unnecessary to mention societies in countries which cannot now be reached by mail. No attempt has been made to include bird protective and similar organizations, but a list of 134 State Audubon Societies and local bird clubs may be found in 'Bird-Lore,' XIX, pp. 381-390, Dec., 1917.—T. S. P.

American Ornithologists' Union. Founded Sept. 26, 1883, incorporated Nov. 14, 1888. *The Auk*.

Secretary T. S. Palmer, 1939 Biltmore St., N. W., Washington, D. C.

Cooper Ornithological Club. Founded June 22, 1893. *The Condor*.

Secretary Northern Division, Mrs. Amelia S. Allen, 37 Mosswood Road, Berkeley, Calif.

Secretary Southern Division, L. E. Wyman, 3927 Wisconsin St., Los Angeles, Calif.

Secretary Intermountain Chapter, Ashby D. Boyle, 351 5th Ave., Salt Lake City, Utah.

Delaware Valley Ornithological Club. Founded Feb. 3, 1890. *Cassinia*.

Secretary J. Fletcher Street, Beverly, N. J.

Nebraska Ornithologists' Union. Founded July 15, 1899. *The Wilson Bulletin*.

Secretary-Treasurer Prof. M. H. Swenk, Lincoln, Nebr.

Nuttall Ornithological Club. Founded 1873. *Memoirs*.

Secretary Campbell Bosson, 30 State Street, Boston, Mass.

Wilson Ornithological Club. Founded Dec. 5, 1888. *The Wilson Bulletin*.

Secretary A. F. Ganier, 1221 17th Ave., South, Nashville, Tenn.

The Avicultural Society. *Avicultural Magazine*.

Hon. Correspondence Secretary, Dr. A. G. Butler, 124 Beckenham Road, Beckenham, Kent, England.

Hon. Business Secretary, Miss R. Alderson, Park House, Worksop, England.

British Ornithologists' Club. Founded Oct. 5, 1892. *Bulletin*.

Editor, D. Seth-Smith, 34 Elsworthy Road, South Hampstead N. W. 3, England.

British Ornithologists' Union. Founded Nov. 17, 1858. *The Ibis*.

Hon. Secretary E. C. Stuart Baker, Zoological Society, Regent's Park, London.

Dansk Ornithologisk Forening. *Tidsskrift*.

Secretary P. Jespersen, Marstandsgrade 25c, Copenhagen, Denmark.

Nederlandsche Ornithologische Vereeniging. *Ardea*.

Secretary Dr. L. F. De Beaufort, Eerbeek, Holland.

Club van Nederlandsche Vogelkundigen. Jaarbericht.

Secretary Baron René C. E. G. J. van Snoukaert von Schauburg, Doorn, Holland.

Royal Australasian Ornithologists' Union. Founded Nov. 7, 1900. The Emu.

Hon. Secretary W. H. D. Le Souëf, Zoological Gardens, Melbourne, Victoria, Australia.

Sociedad Ornitológica del Plata. Founded 1917. El Hornero.

President, Dr. Roberto Dabbene, Museo Nacional Historia Natural, Buenos Aires, Argentina.

South African Biological Society. Founded 1916.

Secretary Chas. K. Brain, Box 513, Pretoria, Transvaal, South Africa.

South Australian Ornithological Association. Founded 1899. South Australian Ornithologist.

Acting Secretary F. M. Angel, 113 Grenfell St., Adelaide, South Australia.

THE Royal Australian Ornithologists' Union is to be congratulated upon the generous gift of \$5,000 received from one of its members, H. L. White, Esq. Mr. White is well known for his generosity and his splendid ornithological collection has only recently been given to the Australian National Museum where he thought it would be of more use in advancing a knowledge of Australian ornithology.

Science certainly owes a debt of gratitude to such benefactors. After all it is the ornithologists of the various countries who were originally responsible for the development of the popular interest in birds which has resulted in the Audubon Societies and kindred organizations, which are doing such splendid work today. The patrons of this movement however should keep Mr. White's example in mind and not forget the needs of the parent organizations, like the American Ornithologists' Union, whose activities in the lines of research and publication could be vastly increased by adequate endowment.

WE are glad to welcome a new arrival in the field of ornithological journalism in 'El Hornero' the Proceedings of the Ornithological Society of La Plata, with headquarters at Buenos Aires. The first number which appeared in October, 1917, deserves the highest commendation and we wish the publication every success. The cover following the example of most other ornithological journals bears a vignette of the bird after which the publication is named — a pair of 'Horneros' (*Furnarius rufus*) and their wonderful mud nest.

THE MEMBERS OF THE A. O. U.— In 1901, under an amendment to the By-Laws, provision was made for a class of Members intermediate between Fellows and Associates. The number was limited to 75, nominations were

made by the Council to the Union, and the affirmative votes of three-fourths of the Fellows present were necessary for election. The establishment of this class was the result of several proposals to increase the number of Active Members (now known as Fellows) and to provide some form of recognition of the more active workers among the Associates. Fifty-three Members were at once elected and thirteen more in the following year.

Although the list was never filled the limit was increased to 100 in 1906 and at the San Francisco meeting, in 1915, Members were given the right to vote for the election of officers, Members, and Associates. As a result the business sessions have since been well attended. The list has now reached 80 the largest number since the class was created. In addition 16 others have been promoted to the class of Fellows, 13 have dropped out, and 11 are deceased, making a total of 120 persons who have thus far qualified as Members. Not more than five can now be elected at any one meeting and this limitation with losses through promotions, resignations, and deaths, makes the increase rather slow. Even if the maximum number are elected at each meeting the present limit is not likely to be reached for several years.—T. S. P.

CALLED TO THE COLORS.—Since the publication in the April number of 'The Auk' of the second list of A. O. U. members in military service, several new names and a few changes have been reported. The additions are as follows:

ANDERSON, ERNEST M., Esquimalt, B. C.

BRADLEE, THOMAS STEVENSON, Boston, Mass. Major Quartermaster Corps, Personnel and Transportation Division, Governor's Island, N. Y.

CROSBY, MAUNSELL SHIEFFELIN, Rhinebeck, N. Y. Captain Quartermaster's Corps, National Guard, Camp Mills, Hempstead, N. Y.

HALL, F. GREGORY, Milton, Wis. In photographic work in the Army.

LEISTER, CLAUDE WILLARD, Ithaca, N. Y. Private 103d Signal Corps, Camp Hancock, Augusta, Ga.

LINCOLN, FREDERICK CHARLES, Denver Colo.

MAYFIELD, DR. GEORGE R., Nashville, Tenn. Am. Expeditionary Forces, in France.

McMAHON, WALT. F., New York, N. Y.

METCALF, FRANKLIN POST, Washington, D. C. Private Co. C, 303d Signal Battalion, Camp Dix, Wrightstown, N. J.

MITCHELL, DR. WALTON IUNGERICH, Wichita, Kans. Captain Med. Corps, Camp Funston, Kans.

NOBLE, GLADWYN KINGSLEY, Cambridge, Mass. Seaman U. S. Naval Station, Hingham, Mass.

PALMER, R. H., Pocatello, Idaho.

PANGBURN, CLIFFORD HAYES, New Haven, Conn. Acting Lieut. Red Cross in France, now in the United States.

ROGERS, CHARLES HENRY, New York, N. Y. 9th Recruit Co., Camp Hancock, Augusta, Ga.

STODDARD, HERBERT LEE, Chicago, Ill.

TYLER, DR. WINSOR M., Lexington, Mass. Captain Medical Reserve Corps, Ft. Adams, Newport, R. I.

WOOD, DR. CASEY ALBERT, Chicago, Ill. Major, Office Surgeon General, Washington, D. C.

WRIGHT, HORACE WINSLOW, Boston, Mass. In the Navy.

The following changes should also be noted. Captain C. Wm. Beebe, and Lieutenants James P. Chapin and James L. Peters are now in France; Lieut. Ludlow Griscom is on duty in the Military Intelligence Office in the War Department, Washington, D. C.; and Francis Harper and Ernest G. Holt have been commissioned Lieutenants. Thos. D. Burleigh is now in the 20th Engineers (Forest), and Colin C. Sanborn, 149th Artillery, is now in France. In the Navy Ensign W. Sprague Brooks, recently stationed at Newport, R. I., has been discharged on account of physical disability, and Private Douglas C. Mabbott, in the Marine Corps, is now in France.

Relatives or friends who may have additional information concerning these or other members are requested to communicate with the Secretary giving any facts as to rank, branch of the service or present location of members in military service in order that necessary corrections in the list may be made from time to time.

T. S. Palmer,
Secretary.

1939 Biltmore St., N. W.
Washington, D. C.

FELLOWS and Members are reminded that a provision of the By Laws requires that nominations to the classes of Fellows and Members shall be made in writing, signed by three Fellows or Members, and delivered to the Secretary at least three months prior to the Stated Meeting. At present there are no vacancies in the class of Fellows. Nominations for Members should be in the hands of the Secretary not later than August 15. Nomination blanks may be had upon application.

THE thirty-sixth stated meeting of the American Ornithologists' Union will be held at the American Museum of Natural History, New York City, November 12-14, 1918, with a business session of the Fellows and Members on the evening of the 11th. All members of the Society should keep the date in mind and prepare to be present if possible.

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1



2

1. Breeding grounds of Spoon-billed Sandpiper at Providence Bay, Siberia, showing ice conditions June 21, 1913. Two nests of the Sandpiper were found at points near middle and at extreme left of photograph.

2. Nest and eggs of Spoon-billed Sandpiper (in situ), Providence Bay, Siberia, June 22, 1913.

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THE NESTING GROUNDS AND NESTING HABITS OF THE SPOON-BILLED SANDPIPER.¹

BY JOSEPH DIXON.

Plate V.

THE Spoon-billed Sandpiper (*Eurynorhynchus pygmaeus*) is essentially an Asiatic species. There are but three specimens claimed to have been taken in North America, as far as known to the author, with some doubt attached to the locality of capture of one of these, which fact probably indicates that the occurrence of the bird in North America is irregular or casual. If the species nests on the Arctic shores of Alaska, or even habitually visits the region, it is reasonable to believe that the presence of so peculiar a bird would have been detected by more of the naturalists that have collected along the Alaska coast between Bering Strait and Point Barrow.

The Spoon-billed Sandpiper appears to be unknown to the American Eskimo, for the author was unable to find one among those interviewed who recognized it when skins were exhibited. On the other hand the "Chuckchies" of northeastern Siberia are familiar with the species, calling the bird by name when shown specimens.

The species is included in the A. O. U. 'Check-List' as a North

¹ Contribution from the Museum of Vertebrate Zoölogy of the University of California.

American bird on the basis of a "summer" specimen taken by Captain Moore of the British Ship Plover, on Choris Peninsula, Kotzebue Sound, Arctic Alaska, during the summer of 1849 (Coues, 1884, p. 78, footnote). This was the first and, for many years, the only known example of the species in summer plumage, and from 1849 until 1915 it was the only recorded specimen from North America. Hence the position of this individual specimen has been unique, and we are able to check up discrepancies in different published accounts with the reasonable assurance that the varying statements encountered all refer to the same bird. The first record that the author has been able to find of this particular specimen is in the 'Proceedings' of the Zoological Society of London for 1859 (p. 201) where it is mentioned as having been exhibited by Mr. Sclater at a meeting of the Society. At that time, ten years after its capture, the bird was supposed to have come from the "Northeastern Coast of Asia." In 1903 this same specimen seems to have afforded the only basis for Coues' statement (p. 813) concerning the species: "breeding" "on the Arctic coast of Alaska." The history of this specimen in literature is shown on the following diagram (Fig. 1), illustrating the relation of all subsequent published statements to the original record in 1859, and also how the supposed locality of capture has shifted from Asia to North America.

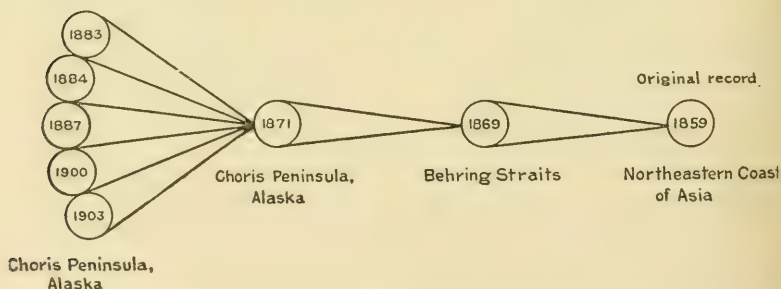


Fig. 1. Diagram of records relative to the first known "summer" specimen of Spoon-billed Sandpiper showing: (1) relation of records; (2) gradual shifting of the records of the locality of this specimen from Asia to North America.

1903. Coues, p. 813. "Breeding on the eastern Arctic coast of Siberia, and also on the Arctic coast of Alaska."

1900. Grinnell, p. 74. "This specimen was in summer plumage and was taken on the Choris Peninsula by Captain Moore of H. M. S. Plover in 1849."
1887. Nelson, p. 112. "The presence of this remarkable little Sandpiper in the list of birds of Alaska is due to the capture of a specimen at Choris Peninsula, during the summer of 1849, by the captain of the British ship Plover — Proceedings of the Zoological Society (1871, p. 110)."
1884. Coues, p. 78. "It is recorded by Harting, P. Z. S., 1871, pp. 111, 114, from Choris Peninsula, the specimen said to have been procured there in 1849, and figured in the Ibis, 1869, p. 426, Pl. XII."
1883. Nelson, p. 87. "The record of this specimen is in the proceedings of the London Zoological Society for 1871, p. 110."
1871. Harting, p. 111. "It was obtained by Capt. Moore on the Choris Peninsula. . . . This specimen was described and figured in 'The Ibis' for 1869, p. 426, Pl. XII."
1869. Harting, p. 433. "24. One in summer plumage from Behring's Straits, by expedition under Capt. Moore in H. M. S. 'Plover' (Proc. Zool. Soc. 1859, p. 201). Now in new Museum at Oxford."
1859. Secretary Zool. Soc. London, p. 201. "Mr. Sclater exhibited specimens of two rare species of Arctic birds from the collection of John Barrow, Esq. . . . One of these was the new species of Diver with a white bill, described by Mr. G. R. Gray as *Colymbus adamsi*. . . . The other was an example of the exceedingly scarce Wader with a spatulated bill *Eurynorhynchus pygmaeus*. . . . in what was apparently its summer dress, the head, neck and breast being rufous. . . . The locality of this specimen was supposed to be the North-eastern Coast of Asia."

The following data regarding the itinerary of the *Plover* on this particular voyage have been obtained chiefly from 'The Tents of the Tuski' by Lieut. W. H. Hooper, an officer under Capt. Moore during this voyage of the *Plover*. Seeman's narrative of the voyage of H. M. S. *Herald*, 1845-51, also throws considerable light on this voyage of the *Plover*, as both ships were sent on the same mission. The *Plover* and *Herald* were two of several ships sent out between 1848 and 1852 from England to search for Sir John Franklin. The *Plover* sailed from England in January, 1848, on this voyage (Seemann, 1853, p. 191) but being a slow sailer did not reach her destination, Kotzebue Sound, that year. The *Plover* went into winter quarters in what is now known as Plover Bay, a small bay within Providence Bay, northeastern Siberia

(Hooper, 1853, p. 12). The vessel remained frozen in the ice at this point from October, 1848, until the last of June, 1849. Hooper (1853, pp. 206–207) states “we sailed from Emma’s Harbor at the end of June, and proceeded up Behring’s Straits, anchoring several times near the Asiatic shore, on which occasions parties of our friends visited the ship. The last point of contact was the Bay of St. Laurence.” From this point “we steered for Kötzebue Sound and anchored near Chamisso Island on the 14th of July.” Here Lieutenant Hooper started ashore but was called back by the arrival of the *Herald*, and “both ships’ crews were therefore immediately set to work to transfer stores and provisions. On the 18th the ‘Herald’ and ‘Plover’ weighed at an early hour.” Seemann (1853, p. 193) states that the *Plover* was “off Wainwright Inlet on the 25th of July, 1849.” She returned from her Arctic cruise and again met the *Herald* at Kotzebue Sound on September 2, 1849. From Simmonds (1852, p. 308) we learn that “the Plover was safely ensconced for the winter of 1849–50 in Kotzebue Sound.”

In looking over the ten species of birds, specimens of which are indicated by Harting as having been obtained on the Choris Peninsula in 1849 by Captain Moore of the *Plover* (Harting, 1871, p. 114; Grinnell, 1900, p. 66), we find that the list contains no species peculiar to North America. However, we do find that at least two of the species (Spoon-billed Sandpiper and Mongolian Plover) are essentially Asiatic. To the author’s knowledge only two other American specimens of the Spoon-billed Sandpiper and no other specimen of the Mongolian Plover have been claimed to have been taken in Alaska since 1849.

The *Plover* and her crew wintered in 1848–49 and spent the main portion of the breeding season of 1849 along the coast of north-eastern Siberia, the region which has recently been proved to be the main breeding ground of the Spoon-billed Sandpiper (Brooks, 1915, p. 382). On the other hand, only four days (July 14–18, 1849) were spent at Choris Peninsula, Kotzebue Sound, most of this time being devoted to transferring stores aboard the ships (Hooper, 1853, p. 213).¹ Under the circumstances it would seem

¹ Mr. W. L. Sclater, Editor of ‘The Ibis,’ was written to in regard to the present condition of Captain Moore’s specimen of *Eurynorhynchus pygmaeus*. At his kind solicitation, both

that the first record (1859) was correct and that Captain Moore's specimen really did come, as first recorded, "from the North-eastern Coast of Asia." The present author believes this to have been the case.

Two other questionable American records of the Spoon-billed Sandpiper have been reported. Ridgway (1881, p. 85) states: "Spoon-billed Sandpiper — Point Barrow, Arctic Coast of Alaska, *vide* Dr. T. H. Bean." Bean (1882, p. 165), however, records a single specimen, secured by a native boy at Plover Bay, Siberia, "most probably late in August, 1880." Seebohm (1888, p. 441) states: "Nelson obtained a specimen in Alaska." This appears to have been an error, since Nelson (1887, p. 112) states that he secured a single specimen at Plover Bay, on the Siberian shore in 1881 and then adds "but not another individual of this rare bird was seen."

The only well established occurrence of the Spoon-billed Sandpiper in America is that vouched for by Fred Granville of Los Angeles, California, who on August 15, 1914, took two specimens at Wainwright Inlet, on the Arctic Coast of Alaska (referred to heretofore only casually, by Swarth, 1915, p. 136). One of these specimens, a female, is now number 3552 in the collection of A. B. Howell, of Covina, California, while the other, a male, is number 1698 in the collection of G. Willett of Los Angeles. Through the courtesy of these gentlemen, the writer has been enabled to examine the Granville specimens and to compare them with a male bird taken at Cape Serdze, Siberia (no. 16699, Mus. Vert. Zool.), and another male taken by Granville, July 12, 1914, at Russian Spit, Siberia (no. 3551, Howell coll.). Both of the Wainwright specimens, although taken the middle of August, are still in the summer plumage, with the chestnut edgings of the feathers on the upper parts, and the chestnut wash on the head and throat almost as

the bird and the museum records concerning it have been examined by Mr. Henry Balfour, curator of the Pitt Rivers Anthropological Museum at Oxford, England. The specimen is still (February, 1918) mounted and in a good state of preservation at the Oxford Museum, having been kept under a small bell-glass and away from strong light. No additional information regarding the locality of capture of this specimen was, however, forthcoming. The entry in the Catalogue of the Comparative Anatomy Department of the University Museum at Oxford is as follows: "In summer plumage, obtained in Behring Strait by Capt. Moore, 1849"; while according to the label on the stand on which the specimen is mounted, "This specimen was taken in Behring Straits."

bright as in breeding birds. The writer has been unable to discover any indication of the fall molt in these two specimens.

Mr. Granville has given me a full account of the circumstances under which he took these two Spoonbills at Wainwright Inlet. The following extracts, slightly modified in wording, are from his letter of January 9, 1918. "On August 15, 1914, I and my assistant hiked back of Wainwright to what I judged to be a distance of about ten miles, traveling in a northerly direction. . . . The tundra where I found the Spoonbills was interlaced as far as the eye could see with little lagoons and long channels of water, and in this territory I collected the two Spoon-bills. . . . These birds were shot out of a flock of possibly ten. I followed them for about an hour before I could get a shot at them. The birds would run along the tundra en masse and were undoubtedly gleaning food from the moss. The minute they would catch sight of me they would fly out of shot-gun range. There were about six birds that looked to me through field glasses to be in markedly different plumage from the birds I shot. These six birds, immature as I supposed, seemed to be of a solid color and that a dark gray. On the first shot fired, with which I got two, the birds flew across a lake and I lost track of them, though I spent four or five hours looking for some more. . . . I believe that these birds breed in the neighborhood of Wainwright and hope that at some close future date someone will bear out my statement."

It is a common occurrence for whaling and exploring vessels to visit both the Siberian and American shores during a summer cruise in the Arctic, hence reliability of the collector is the only guarantee as to places of capture of specimens gathered on such a cruise. Since the species under discussion is rare on the American shore and occurs in relatively much greater abundance on its breeding ground on the Siberian side, it is one regarding which mistakes might easily occur. Mr. Granville, while not a well-known collector, has been a member of the Cooper Club for several years, and is a man whose observations we can accept without question.

The writer spent several days at Wainwright Inlet two weeks after Mr. Granville's departure and although the various flocks of sandpipers present, then mostly in winter plumage, were examined

with binoculars, no Spoon-bills could be found. The fall migration was much in evidence at this time. Whether Granville's birds were some that had bred at Wainwright, as he supposed, or were merely stragglers from Siberia after the breeding season, is uncertain. The true status of the species at this point can only be settled by further field work at Wainwright Inlet during the breeding season.



Fig. 2. Map showing summer record stations of Spoon-billed Sandpiper.

From our present data, the range of the Spoon-billed Sandpiper may be defined as follows: The breeding habitat lies along the Arctic coast of northeast Siberia, possibly also at favorable localities on the Alaskan coast (see Fig. 2), spring and fall migration route along the Asiatic shores of Bering Sea and the Pacific Ocean, and winter home in southern India. The following record of specimens from the 'Catalogue of Birds in the British Museum' (Sharpe, 1896, p. 537) affords an outline of the migration route of this bird. An adult male, still in summer plumage, was taken August 8, at the mouth of the Amur River in southwestern Russia. An immature

was secured on October 8 at Hokodadi [Hakodate], Japan, while an adult female was collected at Ragoon, India, on December 1. The spring migration is represented by an adult male in summer plumage taken in April at Shanghai, China.

Although this bird has been known for many years, at least as far back as the time of Linnæus in 1764 (Harting, 1869, p. 428), it was only the winter plumage with which ornithologists were familiar. The summer dress was unknown until 1849, when Captain Moore of the *Plover* took his single specimen. The breeding ground of this species was not definitely known until Johan Koren found young Spoon-billed Sandpipers able to run on July 24, 1909, on the mainland near Koliuchin Island, northeast Siberia. Koren also took a half-fledged young on July 28 or 29, 1909, at Cape Wankarem about seventy miles west of Koliuchin Island (Koren, 1910, pp. 14-15). To John E. Thayer, we are indebted for the first published description of the nest and eggs of this rare wader, based upon a nest with four eggs and the male parent, together with eight downy young, secured by Captain F. E. Kleinschmidt at Cape Serdze, northeast Siberia, July 15, 1910. This article, published in 'The Auk' for April, 1911, was illustrated by colored plates of the eggs and the head and bill of the downy young and adult stages.

Nordenskiöld (1881, p. 43) reports that birds of this species appeared in numbers in June near the winter quarters of the *Vega*. This locality was near the east shore of Koliuchin Bay. Norden-skiöld, however, discovered no evidence of the species breeding at this point and it was nearly thirty years later that Koren found young Spoon-billed Sandpipers in this region.

The present author met his first living Spoon-billed Sandpiper at Providence Bay, Siberia (see Plate V, Fig. 1) the middle of June, 1913, when upon an ornithological cruise in the Arctic in the interests of John E. Thayer, who has kindly permitted the use of such notes and material as were needed in the preparation of this article.

In color, size and actions the Spoon-billed Sandpiper closely resembles the Eastern Least Stint (*Pisobia minuta ruficollis*), the marked similarity between them resulting in both the author and his fellow collector W. S. Brooks, failing to distinguish between the

two species until June 20, after we had been among them for some days. However, despite our initial failure to secure the birds, it is my belief that the Spoon-bill begins to arrive on its breeding grounds by the end of the first week in June. A pair of sandpipers was encountered near the east shore of Emma Harbor, in Providence Bay, on June 6, 1913, which evidently belonged to this species. The male was at this time energetically engaged in his characteristic nuptial song flight while the female fed quietly among the tussocks near the edge of a pond on the tundra.

Although the spatulate tip of this bird's bill is very noticeable when viewed from directly above or below, it is not a character which can be advantageously used to identify the species in the field, for the simple reason that in nearly all close views of the living bird only lateral or frontal aspects of the bill are obtained. Viewed from the side, as shown in Thayer's illustration (*loc. cit.*, Plate II, Fig. 5), the bill is not sufficiently peculiar in outline to be distinguished from those of other small sandpipers at any great distance. Even when a bird was feeding, and the bill was observed under the most favorable conditions, the peculiar shape was not nearly as conspicuous as one would expect. In the author's experience, the most reliable method of identifying the bird in the field was by noting the glint of light that was reflected from the broad tip of the upper mandible when the sunlight struck the bill at a certain angle. Even in flight, the bird could often be identified by this faint beam of reflected light. Our first specimen was collected on June 20, suspicion having been directed to this particular bird by seeing the sunlight reflected from the tip of the bill, as above described.

We found that the Sandpiper had a decided preference for the grassy margins of fresh-water ponds, while single birds were frequently found feeding along the algæ-bordered rims of tundra pools. Sandy lagoons where rivers entered the bay were favored by them as well.

The song and nuptial flight of the male Spoon-bill, attractive as they were to the collector, in sight of such rare birds at last, were as elusive as a will-o'-the-wisp. In fact we were never able to locate a female Spoon-bill on the nest and I have always believed that our lack of success in this regard was due to the warning given

by the male. Upon approaching the nest site, while we were yet afar off, we were greeted by the male in full song. This song, ventriloquial, pulsating, and cicada-like in quality, seemed to come first from one and then from another point in the heaven above. Sometimes we searched the sky altogether in vain, but usually the bird was discovered in rapid flight at an altitude of two or three hundred feet above the earth.

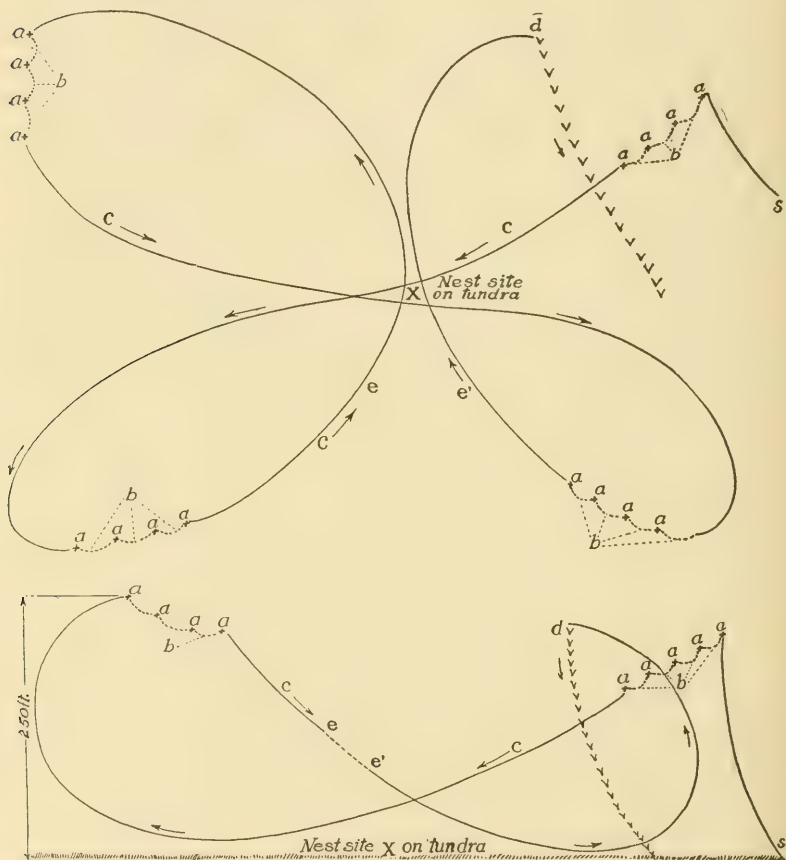


Fig. 3. Diagrams of the nuptial flight of the Spoon-billed Sandpiper. Upper figure represents the flight as viewed from above. Lower figure depicts one half of the same evolution as seen from one side. (s) start, (a) Poise or hover accompanied by song, (b) short dip (no song), (c) rapid sweep down over nest site, ending in new position, (d) gentle glide to earth, (X) nest site on tundra. Flight e to e' in upper figure is represented by the broken line e to e' in the lower figure.

The nuptial flight consists of momentary poises alternating with rapid dips (Fig. 3). When the bird hovers or poises, the rapid beating of the wings is accompanied by a fine, rhythmical, pulsating, buzzing trill: *zeé-c-e*, *zeé-c-e*, *zeé-c-e*, rapidly repeated (Fig. 3a). Following this the bird approaches the intruder, swinging down in a sharp curve until ten feet lower than the previous hovering point (Fig. 3b) where he again poises on rapidly beating wings, pouring forth anew his insistent, musical trill. After repeating this performance four or five times, the songster sweeps down in a long graceful curve (Fig. 3c) until he almost touches the earth near his brooding mate, then curving off, he turns and rises rapidly and almost perpendicularly until almost out of sight. From this new point of vantage the whole performance is repeated. After four or five such excursions, in each of which the intruder is approached from a different direction, the guardian of the nest descends by raising his wings nearly vertically until they form in anterior outline the letter V. The bird thus gliding on motionless wings drops lightly but quickly to earth, uttering the *zeé-c-e* in a richer yet more subdued tone (Fig. 3d). As soon as he touches the earth the song ceases and the silent bird trots quietly off over the moss, where his trim form blends with the lichen and mossy tussocks so that, upon remaining motionless he disappears with amazing rapidity. Time and again we thus lost sight of the birds, which we later discovered by the aid of binoculars, to be standing or squatting motionless within fifty feet of us. Although this "fading out" method of exit is commonly employed by many shore birds, in the case of the Spoon-billed Sandpiper it seems to have been developed to an extreme degree.

The two nests of this bird that came under the author's observation were discovered through flushing the brooding male. The birds were very shy and as there was no cover other than a thin growth of grass about six inches high, approach by stealth was difficult (see Plate V, Fig. 2). The birds usually sneaked off while the observer was forty or fifty yards distant, and in order to find the nest it was necessary to hide, as best one could, near the place where the sandpiper had flushed, until it returned again to the nest. In one instance a depression partly filled with water was the only available hiding place. Fortunately for the watcher the water

was not cold and the male bird returned in twelve minutes to the nest, which contained two *fresh* eggs (Plate V, Fig. 2).

The most striking fact in the domestic life of the Spoon-billed Sandpiper is that the major portion of the household duties, aside from the actual laying of the eggs, is performed by the male and not the female bird. In addition to our own observations Kleinschmidt also has found this to be the case. He states: "Although our observations were limited to but a few, still I believe the male solely attends to the hatching and rearing of the young" (Thayer, 1911, p. 154). In the author's experience, none of the several females taken were found on or within fifty feet of the nest. It is possible, however, that they may have been warned by the male birds and had sneaked off before we were close enough to detect their leaving.

In the unequal division of domestic duties conditions among the Spoon-bills are similar to those among the Phalaropes where the male, after he has been courted and won by the larger and more brilliant female, takes upon himself almost all of the household cares. However, in the case of the Spoon-billed Sandpiper there is nothing to show that the female does the courting although she is the larger of the two. Mr. Thayer in commenting on the relative size of the sexes states: "In looking over my series of fourteen skins, all adults, I find that the females are larger and their mandibles noticeably so" (Thayer, 1911, p. 154). The female Spoon-bill is thus seemingly content to merely lay the eggs, while she lets the male build the nest, incubate the eggs, and take care of the young. In corroboration of the latter statements the author observed a male bird building a nest at Providence Bay, Siberia, June 22, 1913, another male was flushed repeatedly from a nest containing two fresh eggs near the same place on the same day, while a third male was found tending three downy young at Cape Serdze, Siberia, on July 17, 1913.

The nest of this Sandpiper was found to be merely a cavity scratched out among the dead grass blades. It was a shallow affair placed where the grass grew thickest (Plate V, Fig. 2). On June 22, 1913, at Providence Bay, the writer witnessed the construction of a nest from a distance of about forty feet. The bird, a male, scratched and then picked at the dead and matted grass

blades and moss until he had dug out quite a hole. Then he squatted down in the depression and twisted about, pressing against the moss that formed the sides of the nest, until a cavity about three and one-half inches in diameter and an inch deep was formed. Dead leaves from a creeping Arctic willow that grew in the moss nearby, were used to line the nest.

We have the following data regarding the dates at which the eggs are laid and the number of eggs in a set. A clue is also afforded as to the time required for the eggs to hatch.

<i>Locality</i>	<i>Date</i>	<i>Nesting evidence</i>	<i>Collector</i>
Providence Bay, Siberia	June 22, 1913	2 fresh eggs in nest	J. Dixon
Providence Bay, Siberia	June 22, 1913	Nest in course of construction	J. Dixon
Cape Serdze, Siberia	July 15, 1910	4 eggs "just ready to hatch"	F. E. Kleinschmidt
Cape Serdze, Siberia	July 17, 1913	3 young just out of nest	J. Dixon

From the above data it seems probable that the set is of three or four eggs; June 20 to 25 may be taken as the time when laying begins. The eggs of the Spoon-bill found by the author at Providence Bay were not markedly different in markings, shape or color from those of other small sandpipers, such as the Eastern Least Stint. In the field, the eggs of the Spoon-billed Sandpiper appeared to be slightly larger than those of the Stint. The measurements of the four eggs collected by Kleinschmidt are given by Thayer (1911, p. 154) as follows: "1.20 \times .92; 1.22 \times .90; 1.20 \times .88; 1.30 \times .90 inches." For positive identification, we found it advisable to secure the parent bird with the eggs, and in order that there might be no mistake, the incubating male was secured just as he jumped from the nest.

Regarding the time required for incubation, we have only circumstantial evidence to offer (see preceding table), but our observations lead us to believe that about eighteen or twenty days elapse between the time the last egg is laid and the first young hatched.

On July 17, 1913, at Cape Serdze, Siberia, while strolling along the spongy green turf beside a fresh-water pond, my attention was attracted by the "broken wing" antics of a Spoon-billed Sandpiper. Although my eyes remained "glued" on the spot from which the bird arose, no nest or sign of young could be found when

I reached the place. Soon a second bird, presumably the female, arrived on the scene. Both appeared much concerned and from their actions I felt sure that there were young near by. A careful search of the short grass, which was not over two inches high, failed to reveal any living creature. I therefore retired to a grassy mound about twenty yards away and awaited developments. Both parent birds, giving their alarm notes, circled about overhead, where they were soon joined by a pair each of Eastern Least and Temminck's Stints. The two pairs of stints were later found to have broods of downy young in the grass on the opposite shore of the lagoon near by. Soon both Spoon-bills flew off across the lagoon and disappeared, but the male returned promptly, alighting quietly near the margin of the pond. Here he stood motionless for nearly a minute, and then trotted through the grass directly to the spot from which I had first flushed him. At this point he stood still for another full minute, during which time he looked all around, seemingly to make sure that the coast was clear. Having satisfied himself that no active enemy was in sight he stepped forward and bending over uttered a soft call in a low tone "*plee-plee-plee.*" This call was repeated a second time, and instantly there arose directly in front of him a tiny mouse-like brown form, seemingly rising from out of the very ground. With tottering unsteady steps the downy young sandpiper stumbled and fell toward the parent, who continued calling and encouraging it.

Upon my sudden appearance, the old bird gave a quick warning note and at this signal the youngster squatted motionless with neck stretched forward on the ground. Although I knew the exact spot where it disappeared, it was some time before I was able to locate the tiny form, so well did it blend with the clump of reddish moss upon which it had squatted. A careful search revealed no other young sandpipers so I returned to my hiding place. This time I had to wait longer for the male to return and, while I was waiting, a second sandpiper which I believed to be the female arrived but did not go near or call the young.

Two or three minutes elapsed this time between the return of the male and the giving of the low call notes, when as before another downy young quickly arose at the signal and toddled over to its parent. After this second experience I was forced to change

my hiding place, as the male Sandpiper refused to return to the young until I moved. He seemed much concerned upon this last visit, probably realizing that it was high time the young should be hovered and warmed.

I could not understand why all the young had not risen at once in answer to the parent's call but I noticed that he had in each case gone up to within less than two feet of the one in hiding, and then with lowered head facing the chick, gave the call note. In each case it was the youngster thus directly addressed that responded to the signal and arose. The note of the young was a low rusty squeak, scarcely audible to human ears. It was very similar to the note of the young Semipalmated Sandpiper (see Dixon, 1917, p. 190).

As far as my observations went, there was no attempt on the part of the parent to feed the young, and it is my belief that from the time they are hatched the young Spoon-bills hunt their own food. The exercise thus gained was found in the case of young Semipalmated Sandpipers to be essential to the health of the chicks. In addition to keeping warm by running about the young Spoon-bills are hovered and warmed at regular intervals by the parent. The brood mentioned above had survived a fairly severe snowstorm on the preceding day.

An effort was made to carry the three downy Spoon-bills back to the ship alive, and as we had "hopped, skipped and jumped" ashore over a mile of drifting ice cakes, the packing was done with care. A thick nest of cotton was made in the collecting basket, but within an hour the young sandpipers began to go into convulsions and although they were placed inside of the author's "parka" next to his body, they all soon died. Their death seemed to be due to lack of exercise, as they were kept warm, and certainly could not have starved to death in an hour. Manniche (1910, p. 146) reports a similar experience with two downy young of the Sanderling, on the breeding grounds of this species in north-east Greenland.

As has been pointed out by Thayer (1911, p. 154), the bill of the newly hatched young of this Sandpiper shows the characteristic "spoon" well developed. The narrow part of the bill of a downy young Spoon-bill is short compared with that of the adult, while

the spatulate tip is more oval, as compared with the angular outline of the bill of the adult bird. In outline the bill of the young closely resembles the conventional "spade" on playing cards.

Our observations disclosed no peculiar advantage attending the singular shape of this sandpiper's bill, though careful watch was kept to see just how this member was used. On July 17, 1913, a pair of Spoon-billed Sandpipers was watched for half an hour as the two birds fed within fifty feet of the observer, concealed behind a sandy dune. Their favorite feeding ground was a fresh-water pond with a fringe of green algæ about the sandy border. Under these conditions the birds used their bills as any other sandpipers would, as probes to pick out insects or larvæ from the algæ. Occasionally one would hesitate a moment, when the vascular tip of the mandible quivered slightly as though the bird were straining something out of the green algæ. At this time the bill was held at nearly right angles to the surface of the water; it was never used as a scoop along the surface.

The width of the tip of the bill varies greatly in freshly killed specimens, regardless of sex, as shown at time of capture among the twelve specimens we secured. Of two males at hand, one (Mus. Vert. Zool. no. 16699) has a bill with a width of 11.6 mm., while the other (Willett coll., no. 1698) measures only 9.4 mm. in width.

Comparatively little seems to be known regarding the development and molt of the young of this species. Koren found young able to run about on July 24, 1909, on the mainland near Koliuchin Island. On July 29 at Cape Wankarem he found young "half fledged" and got one of these on the wing at fifty yards. Granville, as previously detailed, saw what he thought were six immature birds of this species in the gray or winter plumage at Wainwright Inlet, Alaska, on August 15, 1914. In spite of the considerable accumulation, during recent years, of data relative to the nesting habits of this peculiar spoon-billed wader, there are many important facts in the life history of this species yet to be ascertained.

LITERATURE CITED.

BEAN, T. H.

1882. Notes on birds collected during the summer of 1880 in Alaska and Siberia. *Proc. U. S. Nat. Mus.*, **5**, pp. 144-173.

BROOKS, W. S.

1915. Notes on birds from east Siberia and Arctic Alaska. *Bull. Mus. Comp. Zool.*, **59**, pp. 361-413.

COUES, E.

1884. [Review of] Nelson's Birds of Bering Sea and the Arctic Ocean. *Auk*, **1**, pp. 76-81.
1903. Key to North American birds. (Boston, Page), 5th ed., **2**, pp. vi + 1152, profusely illustrated.

DIXON, J.

1917. Children of the midnight sun. *Bird Lore*, **19**, pp. 185-192, 10 figs. in text.

GRINNELL, J.

1900. Birds of the Kotzebue Sound region. *Pacific Coast Avifauna*, **1**, pp. 1-80, 1 map.

HARTING, J. E.

1869. On rare or little-known Limicolæ. *Ibis*, **5**, pp. 426-434, 1 pl. and 1 fig. in text.
1871. Catalogue of an Arctic collection of birds presented by Mr. John Barrow, F. R. S., to the University Museum at Oxford; with notes on the species. *Proc. Zool. Soc. London*, **1871**, pp. 110-123, 2 figs. in text.

HOOPER, W. H.

1853. Ten months among the tents of the Tuski. (London, Murray), pp. xv + 417, 1 pl., 10 figs. in text, 1 map.

KOREN, J.

1910. Collecting on Tchoukotsk Peninsula. *The Warbler*, **6**, pp. 2-15, 19 figs. in text.

MANNICHE, A. L. V.

1910. The terrestrial mammals and birds of north-east Greenland. *Danmark-Ekspeditionen Til Grønlands Nordostkyst 1906-1908*, København, Bianco Lunos Bogtrykkeri, Bind. V. Nr. 1, pp. 1-199, pls. I-VII, 43 figs. in text., 1 map.

NELSON, E. W.

1883. Birds of Bering Sea and Arctic Ocean. *Cruise of Revenue Steamer Corwin in Alaska and the north west Arctic Ocean in 1881* (Washington, Govt. Printing office), pp. 55-118, 4 pls.
1887. Report upon natural history collections made in Alaska between the years 1877 and 1881. *Arctic Series of Publications issued in connection with the Signal Service, U. S. Army*, **3**, 337 pp., 21 pls.

NORDENSKIÖLD, A. E.

1881. The voyage of the Vega round Asia and Europe. (London, Macmillan Co.), 2, pp. xvii + 464, with 5 steel portraits, numerous maps and illustrations.

RIDGWAY, R.

1881. Nomenclature of North American birds chiefly contained in the U. S. National Museum. Bull. U. S. Nat. Mus., 21, pp. 1-94.

SEEBOHM, H.

1888. The geographical distribution of the family Charadriidae or the plovers, sandpipers, snipes and their allies. (London, Sotheran), pp. xxiv + 524, 21 pls., many unnumbered figs. in text.

SEEMANN, B.

1853. Narrative of the voyage of H. M. S. Herald 1845-51. (London, Reeves), 2, pp. vii + 302, 1 pl.

SHARPE, R. B.

1896. Catalogue of the Limicolæ in the collection of the British Museum. 24, pp. xii + 794, 6 pls., many figs. in text.

SIMMONDS, P. L.

1852. Sir John Franklin and the Arctic regions. (Buffalo, Derby), pp. xvii + 396, many illustrations, 1 map.

SWARTH, H. S.

1915. Minutes of meeting of Cooper Ornithological Club. Condor, 17, p. 136.

SECRETARY ZOOL. SOC. LONDON.

1859. [Report of Meeting of May 10, 1859.] Proc. Zool. Soc. London, 1859, p. 201.

THAYER, J. E.

1911. Eggs of the Spoon-bill Sandpiper (*Eurynorhynchus pygmaeus*), Auk, 28, pp. 153-155, 2 pls.

A WINTER CROW ROOST.¹

BY CHARLES W. TOWNSEND, M.D.

PRIOR to the winter of 1916-17 most of the Crows of the eastern parts of Essex County, Massachusetts, spent the nights in roosts in the pine thickets at Annisquam and West Gloucester. Hither from all directions in winter afternoons these birds could be seen wending their way. The general course of flight over the Ipswich dunes was from north to south. There were, however, several small roosts in the Ipswich region. One was in a grove of white pines and cedars on the south side of Heartbreak Hill; another, which lodged about five hundred birds, was in one of the pitch pine thickets of the Ipswich dunes. In November, 1916, I discovered that the ground under and near the large thickets of evergreens and hard woods on the southerly side of Castle Hill close to Ipswich beach was covered thickly with Crow pellets and droppings. I was not surprised, therefore, to find that the afternoon flight of Crows was directed towards these thickets, and that the birds were passing over the dunes in an opposite direction to that taken in former years. Whether the great roosts at Annisquam and West Gloucester have been deserted or not I cannot say, but it is evident that the larger number of birds have transferred their winter nights' lodgings to Castle Hill.

Twenty-five years ago the whole southerly side of Castle and High Hills was pasture and mowing land. The owner at that time began planting trees on a large scale. At first only visible in the grass these have grown to a height of thirty or forty feet, and there is now a respectable forest over twenty or thirty acres of land. The evergreen trees are largely European species — Scotch and Austrian pines with spruces and firs. There is a large grove of European larches, and there are patches of willows, maples, ashes, buttonwoods and other deciduous trees.

In the short winter afternoons the Crows begin their flight to the roost long before sunset. By three o'clock or even as early as one o'clock, especially in dark weather and in the short December days, this bed-time journey begins, while in the latter part of

¹ Read before the Essex County Ornithological Club, December 10, 1917.

February the flight is postponed until half past four or a quarter of five. From every direction but the seaward side the Crows direct their course towards the roost. Three main streams of flight can be distinguished: one from the north, from the region of the Ipswich and Rowley "hundreds,"—the great stretches of salt marsh that extend to the Merrimac River,—a second from the west and a third,—apparently the largest of all, broad and deep and highly concentrated,—from the south.

It was the last of these rivers that on a cold December afternoon with a biting wind from the northwest I first studied in company with Mr. Francis H. Allen. It was an impressive sight. About 3 o'clock the Crows began to appear, singly and in small groups, beating their way in the teeth of the wind towards the north. In flying over the estuary of the Castle Neck River they kept close to the water as if to take advantage of the lee behind the waves; over the land they clung to the contour of the dunes. As we walked among these waves of sand the Crows often appeared suddenly and unexpectedly over the crest of a dune within a few feet of us. Silently for the most part, except for the silken rustle of their wings, they flew over in increasing numbers until it was evident that they were to be counted, not by hundreds, but by thousands. Many of them alighted on the dunes to the south of the roosting place; sand, bushes and stunted bare trees were alike black with them. Others assembled on the bare hillside to the east. About sunset a great tumult of corvine voices issued from the multitude,—a loud cawing with occasional wailing notes,—and a black cloud rose into the air and settled in the branches of the bare trees to the west of the roost. From here as it was growing dusk they glided into the evergreens for the night.

The last day of the year 1916, I spent with Dr. W. M. Tyler in the dunes. The wind was fresh from the northwest,—the temperature was 15° Far. at 6.30 A. M., 18° at noon and 20° at 6 P. M. As early as one o'clock in the afternoon a few Crows were seen struggling north over and close to the surface of the dunes. Others were noticed flying high and towards the south. This southerly flight came from over Castle Hill to the north, passed the roost and continued on over the dunes. At half-past three some of these birds, which were apparently turning their backs on their usual

night's lodging place, met with a large company coming from the south and all settled together in the dunes about two miles south of the roost. Some of the birds coming from the north, however, settled on the bare fields by the roost, and their numbers here were augmented by a stream from the west. This concourse on the hillside set up a great tumult of cawings just before four o'clock. At five minutes after four the united multitude of northerners and southerners rose from their meeting place in the dunes and flew low to join their noisy brethren on the hillside. This river of black wings from the south was a continuous one and it was joined just before its debouch on the hillside by the stream from the west. The river from the north had split into two layers: the lower flying birds came to rest on the hill,—the higher flying ones favored by the strong northwest wind, continued on their way south, notwithstanding the great current that was sweeping north below them. They joined their comrades in the dunes and retraced their steps. No signs of starvation and impaired vigor in these unnecessary flights, or in the games of tag in which two or more of the birds would at times indulge!

The pace is now fast and furious. The birds are anxious to get within touch of the roost before it is dark but none have yet entered it. At 4.15 P. M., 135 birds pass in a minute from the south alone on their way to join the concourse on the hillside. A little later this southern river becomes so choked with birds that it is impossible to count them. From our point of vantage in a spruce thicket on the hill we can see that this flock stretches for two miles into the dunes and it takes four minutes to pass. The speed of flight, therefore, must be roughly about thirty miles an hour. At 4.15 P. M. the sun sets, but in the yellow glow of the cloudless sky the birds can be seen pouring by from the west and south. The bulk of the stream from the north now comes to rest on the hillside for only occasionally can a crow be seen flying to the south over the heads of the southern stream.

At 4.35 P. M. Dr. Tyler and I again counted the southern stream for a minute as they flew silently between us and the lighthouse. One of us counted 160 the other 157 birds, so it is probable that our counts were fairly accurate. This constant watching of the black stream from the south against the white light-house pro-

duced in both of us a curious optical illusion. The light-house and dunes seemed to be moving smoothly and swiftly from north to south!

At 4.37 P. M. a great cawing arose from the hillside and a black cloud of birds rose up, some to enter the roost, others to subside on the hillside. It was evident that the birds from time to time had been diving into the roost. At 4.40 P. M. it was rapidly growing dark and the tributary streams were evidently dwindling. Only 50 went by the light-house in a minute. Five minutes later it was nearly dark and only a few belated stragglers were hurrying to the concourse on the hill.

At 4.45 P. M. Dr. Tyler and I walked around to the north of roost and although we could see nothing in the darkness we could hear the silken rustle of wings and feathers as the Crows were composing themselves for the night's rest among the branches of the trees. The babble of low conversational notes that went up from the company suggested the sounds of a Night Heronry although *cawings* and *carrings* were interspersed with the *kis* and *uks* and *ahhs*. The odor was that of a hen-yard. The temperature in the grove, with its hundreds of corvine furnaces breathing out air heated to 105° or thereabouts, was probably distinctly higher than in the open. We refrained from entering the thicket, for any attempt to do so aroused the birds to flight.

In the dim light we could make out that the hillside field between the roost and the sea was still blackened with birds that were continually rising up and entering the trees. Some of them perched temporarily on the bare tops of the hard woods where they were visible against the sky. The noise and confusion were great. It would seem as if the roost was so crowded that the birds had to wait their time for a chance to get in and that a constant shifting of places and crowding was necessary before the Crows could settle in peace for the night. Hence the prolonged and varied conversation; hence the profanity.

It was an intensely interesting experience, this observation of the return of the Crows to their night's lodgings, and one wished, for eyes all about the head, well sharpened wits to interpret and a trained assistant to take down notes. How many birds spent the night in the roost? That is a difficult question to answer, but a

rough estimate can be made. There were three streams entering the roost beginning at one o'clock and continuing until a quarter of five. The largest of these was from the south, the next largest from the west and the smallest from the north. The greatest flight occurred in the hour before dark. From counts made in the stream from the south this flow averaged at least a hundred in a minute or 6,000 in the hour. If we suppose that an equal number arrived in the combined western and northern streams there would be 12,000 occupants in the roost, a very moderate estimate, I believe.

Crows were not the only species that sought refuge for the night in these evergreens. At half-past four a Starling was seen flying thither. But the great flight of Starlings appeared shortly after four. There were about two hundred of them — a mere nothing compared with the enormous multitudes that are soon destined to inhabit these regions, for the European Starling, introduced in some evil moment to these new lands of the western Hemisphere, is increasing by leaps and bounds. This flock of two hundred Starlings flew by with a whistling of wings straight for the roost, but on its arrival at once began a series of aerial evolutions which lasted for half an hour by the watch, before the flock finally entered the roost for the night. At times the birds would spread out like a mist on the hillsides at times they would combine to form a compact dark ball; again they would stream off like a whisp of smoke, and turn and twist and snap the whip in a most amazing manner. The exhibition of this troop of Starlings was that of well trained performers executing difficult and intricate evolutions without hesitation and without fault. The rhythm and harmony of all their movements was perfect; the speed of action was so great that it was at times difficult to follow them with the eye. They opened or closed their ranks, they deployed to the right or to the left, they descended or ascended as if impelled by a common mind or as if possessed of perfect telepathic intercommunication. One could hear no word of command and there appeared to be no leader. The spirit of play was in it all and the joy of untiring energy, of perfect mastery of the air and of consummate grace and skill. It was a marvelous and mysterious exhibition.

I have often watched from my house the western stream of

Crows go by bound for the roost. With a strong northwest wind the greater number fly in the lea of the hill close to the marsh. A smaller number push their way in the valley to the north partly sheltered from the wind by the trees. It is rare that one exposes himself to the full sweep of the wind over the top of the hill. When the wind is in the east the Crows fly close to the marsh and follow the windings of Castle Creek. With a westerly breeze, however, the birds fly high and, silhouetted against the sunset glow, the birds pass over the hill at great speed, alternately flapping and sailing. Those that fly over the marshes keep at the level of the top of the hill instead of skimming close to the ground as they do in unfavorable winds. I have counted eighty and at times as many as one hundred and twenty passing in a minute in this western tributary to the roost.

The afternoon of the twenty-second of February, 1917, was cold and clear with a wind from the northwest. I made my way to the top of Castle Hill in order to watch the stream of Crows from the north. The first arrivals came at half past four o'clock. They were flying over the ice-filled marshes of the Ipswich and Plum Island Rivers, on the lookout perhaps for a last scanty portion of food before bedtime. On reaching Castle Hill they flew up over its crest and glided down into the hard woods to the east and west of the evergreen roost. Here they took part in the regular noisy evening crow reception of the three streams before retiring for the night.

At the full of the moon on the sixth of January I visited the roost at 9 P. M., a time when all well regulated crows should, I had supposed, be sound asleep. As I approached the roost much to my surprise I heard distant sleepy cries like those of young herons, and when I reached the edge of the roosting trees there was a tumultuous rush and bustle of Crows flying from tree to tree and overhead. Strain my eyes as I would only occasionally could I catch sight of a black form, although the air was brilliant with the moonlight and the reflection from the snow. I turned back at once as I had no desire to disturb the birds' slumbers but it was evident that many, even at this late hour, had not settled down for the night.

The morning flight from the roost takes less time than the evening return. As I approached it in the semi-darkness at 6.25 A. M. on

January 7, a distant cawing could be heard and a minute later nine Crows were seen flying off to the south, and three minutes later, nine went off to the west. At half past six, after a great uproar of *caws* and *uks*, occasional rattles and wailing *ahhhs*, a broad stream boiled up from the roosting trees and spread off towards the west, obscurely seen in the dim light except when the birds stood out against the beginning red glow in the east or against the light of the setting moon in the west. As I stood concealed on the hillside among a grove of spruces, the Crows passed over my head, noiselessly except for the silken swish of their wings, fully a thousand strong. Then no more for over five minutes although the tumult in the roost continued in increasing volume. At 6.40 the roost boiled over again, but the birds spreading in all directions soon united into a black river that flowed over the dunes to the south. The settings for this black stream were the white sand dunes and the luminous glow in the east which had become a brilliant crimson fading to orange and yellow and cut by a broad band of pink haze that streamed up to the zenith. The morning star glowed brightly until almost broad daylight. The sun rose at 7.14. At 7 I entered the roost and hurried away the few hundred remaining birds some of whom were in the bare tops of the hardwoods ready to depart, while others were still dozing in the evergreens below. The air was close and smelt like a hen house. Pellets and droppings were everywhere.

On the last day of 1916, Dr. Tyler and I watched the crows leaving the roost. We arrived at 6.40, too late to see the first departures. From time to time we counted the birds going by in the stream to the south and as our counts showed a remarkable agreement they may be taken as substantially accurate. At 6.45, 105 passed in a minute; at 6.50, 125 passed at 6.55, 58 passed, at 6.58, 121 passed and at 7.00, 63 passed.

The Starlings left the roost at 7 o'clock and passed us with a chorus of shrill cries or perhaps it was the swish of their wings that we heard. They were intent on the day's hunt for food and did not waste time on setting-up evolutions. At 7.13 the sun rose and the roost was silent and deserted.

In the early part of the winter there is plenty of food for the Crows. The bayberry and staghorn sumac bushes, the poison ivy, cat briers and red cedars are laden with their fruit. The salt

marshes and beaches furnish a bountiful supply of food in the form of molluscs and crustaceans as well as in dead fish and other carrion brought up by the tides. In fact it is these marshes and beaches that make such a great concourse of crows possible; — the inland country is able to support but a mere fraction of such a multitude. If the winter is a prolonged and severe one, the food problem becomes more and more difficult. All the bayberry bushes that are not covered with snow are stripped of their berries; the red flames of the sumac are battered and reduced to a spindling central stalk with but a few red furry seeds remaining. The upper beach, the source of so much food supply in dead fish, crabs and molluscs, is encased in ice and built up into a wall; the marshes with their wealth of small snails and mussels is sealed several feet deep in tumbled cakes of ice, and the tide rises and falls in the creeks and larger estuaries under an unbroken icy mantle. All the uplands are buried in snow. It is difficult to conceive how this multitude of red-blooded active birds can glean enough food under these conditions. The number of food calories needed by each Crow must be large. But the Crow like the Indian and all creatures of nature is well able to take care of himself and to utilize every possible source of food supply. Neither a feast nor a famine disturbs his equanimity unless the latter is too prolonged.

Although most of the birds appeared to be endowed with plenty of strength and energy, one at least on February 22 seemed to be suffering from the hard times. This Crow alighted in a feeble tottering manner on a post within forty yards of me, and balanced himself with difficulty. I walked to within thirty yards of him when he wearily took wing only to alight in a similar way on another post a couple of hundred yards away. When flushed from this he managed to fly a few rods to the roosting grove.

Two other Crows previous to this incident were found dead near the roost. Both were normal in size as shown by measurements,¹ and neither showed any signs of injury. One was very thin. The case of the other is worth recording in detail. It was on

¹ In 'The Birds of Essex County,' p. 243, I recorded the examination of a Crow found dead early in March, 1904. "The body was greatly emaciated, the intestines nearly empty, and the stomach contained only a husk of oats and a piece of coal ashes. There was no evidence of disease. The bird weighed only ten ounces and was small in every way,— a case of the small and unfit perishing."

January first, 1917, that I discovered a Crow in the topmost branch of a slender fifty-foot ash tree on the edge of the roost. A string had in some way become entangled about one foot and the branch of the tree. Struggle as he would he could not free himself and although he could perch at ease on the branch, he often hung head downwards from it exhausted by his fruitless efforts. While I watched him and searched my brain for some means for his release, another Crow repeatedly swooped down and passed within a few feet or even inches of the poor captive. Both birds were cawing violently. As it was impossible to climb the slender tree I decided to go on to the beach, hoping that in my absence fortune would favor the bird, and that the string might become untangled. On my return an hour later the victim was still tied fast while on the ground a few yards from the foot of the tree and directly in my path was the body of a Crow still warm. No other Crow was in the neighborhood. The dead Crow was a male of normal size as shown by measurements, its plumage was in good condition and it showed every evidence of perfect health. No injury could be found anywhere — there was no sign of hemorrhage under the skin in the abdominal cavity or in the skull. Fat was present in considerable amount, especially about the viscera.

In order to finish the story it may be recorded here that by the forcible bending down of the top of the slender ash so that the captive Crow could be reached from another tree this unfortunate bird (of its sex I am ignorant) was released only to die on the following day. I shall not attempt to answer the question as to the cause of the death of the Crow whose autopsy I have related, but one is tempted to say that he died of grief for the captive one.

During the greater part of the day the roost is deserted, but there is much to be learned of the ways of the Crow even under these conditions. Pellets and droppings are everywhere on the ground under the trees as well as in the surrounding fields and they are especially obvious when the ground is covered with snow. The fact that the snow in the fields near the roost is well trodden by the Crows and spotted with droppings and pellets might lead one to think that the birds had spent the night there, but these studies have shown that the field was merely a reception room where the birds met before retiring for the night.

The pellets which are ejected from the mouths of the birds after a meal and are composed of the useless and indigestible portions of the meal, are cylindrical in shape, rounded at the ends and measure one to two inches in length and about half an inch or more in diameter. In warm or wet weather they speedily break up and mingle with the soil, but in cold weather they freeze and retain their form. A study of these pellets reveals the nature of the corvine dietary. In times of plenty, as in the early fall when berries are everywhere, the Crows are extravagant and wasteful in their feeding habits. Much nourishment is thrown out in these pellets before it has had time to be digested in the stomach. Like the ancient Romans they empty their stomachs that they may feast the more. Crows take no interest in food conservation; the pellets at these times show much wasted food. Not so in severe winters when famine is close at hand. Then every bit of the waxy coat of myrtle berries is digested off and there are no intact cranberries, as in the bounteous autumn, but only the remnants of skin and seeds. At these times also some ashes are to be found in their pellets, as if the birds were trying to quiet the stomach craving by bulk, and hunger had made them bold in visiting the refuse piles near houses.

I collected at various times, from November to February, several hundred of these pellets, amounting in bulk to 662 cubic centimeters of material after the pellets were broken up into their composite parts. This I sent on to the Biological Survey at Washington and received from Mr. Nelson, Chief of the Survey, the following report:

"The examination of crow roost material sent in by you has been completed by Mr. Kalmbach. It proved to be a most interesting lot of pellets containing many more specifically different items than are to be found in similar material from roosts in this vicinity. I am appending herewith the result of this examination. The numbers connected with the more abundant seeds are approximate, as they were secured by carefully counting the seeds in a portion of the material and then multiplying to get the total.

Insects.

- 1 *Sphæroderus lecontei* (Ground beetle)
Trace of another carabid
Traces of two other unknown beetles
- 3 *Hypera punctata* (clover-leaf weevil)

- 1 Sphenophorus sp. (bill-bug)
- 1 Rhodobænus tridecimpunctatus (bill-bug)
- 1 Sitona hispidula (clover-root curculio)
- 17 acridids (shorthorned grasshoppers)
- 2 Gryllus (crickets)
- 1 hymenopteron
- Trace of a fly
- 2 jaws of caterpillar
- 3 small Tineid cocoons

Other invertebrates.

- Spider fragments and cocoon
- Jaws of 3 Nereis sp. (marine worm)
- 100 Melampus sp.
- A few fragments and about 750 operculi of Littorina sp.?
- Mytilus sp.
- Other mollusk fragments
- Parts of a crab

Vertebrates.

- Bones of fish
- Bones and scales of snake
- Shell of hen's egg
- 4 Microtus pennsylvanicus (Meadow mouse)
- 1 Condylura cristata (Star-nosed mole)
- 2 Blarina brevicauda (Short-tailed shrew)
- Several larger bone fragments (carriion)

Plants.

- 10,000 seeds of Myrica carolinensis (Bayberry)
- 1,200 " " Rhus radicans and R. vernix (Poison Ivy and Poison Sumac)
- 1,100 " " typhina and glabra (Staghorn and Smooth Sumac)
- 80 " " Berberis sp. (Barberry)
- 360 " " Oxycoccus sp. (Cranberry)
- 30 " " Juniperus sp. (Red Cedar and Low Juniper)
- 50 " " Smilax sp. (Cat-brier)
- 100 " " Ilex verticillata (Winter berry)
- 2 " " Vitis sp. (Grape)
- 2 " " Solanum sp. (Night shade)
- A few kernels of oats and hulls
- A few kernels of wheat and hulls
- A few kernels of barley and hulls
- A few kernels of corn (fragmentary) and hulls
- Trace of buckwheat
- Fragments of seeds of pumpkin or squash

Seed and skin of apple
Pulp of pear (?)
Acorn
Meat of an unknown nut
A piece of rotten wood
A piece of cork

Miscellaneous.

A rubber band
Gravel

THE PTERYLOSIS OF THE WILD PIGEON.

HUBERT LYMAN CLARK.

RECENTLY, Dr. Jonathan Dwight called my attention to the desirability of placing on record an account of the pterylosis of the Wild Pigeon (*Ectopistes migratorius*), since material suitable for the purpose is accessible to me. For the use of this material, I take pleasure in acknowledging my debt to Mr. Henshaw and Mr. Bangs, of the Museum of Comparative Zoölogy.

The Museum is so fortunate as to have the skin of a very young nestling (M. C. Z. no. 73216) from Wisconsin, which although covered with its nearly uniform coat of neossoptiles yet shows fairly well the main tracts of the pterylosis. This nestling measures about 90 mm. in length, with the bill about 15 mm. more. The skin is light brown, the neossoptiles are rather bright tawny yellow and the feather-buds of the coming contour feathers are nearly black. The wings and little stump of a tail are too badly dried up to make any study of the quills profitable, but perhaps the most striking feature of the pterylosis is the marked development of the "pelvic wing" so well described and figured by Beebe in the White-winged Dove (1915, *Zoologica*, vol. II, no. 2). In the young *Ectopistes* this consists of nineteen quills as against eighteen in *Melopelia*, but owing to the position of the tibia and the dryness of the skin, it is not possible to determine satisfactorily whether the arrangement of these quills is in reality as different from that

shown in *Melopelia* as it seems to be. Apparently twelve of the quills are on the tibia, crossing its entire width; six and possibly seven of these are main quills and six or perhaps only five are coverts; the outermost are smallest. The other seven feathers are four main quills and three coverts and they lie along the posterior margin of the femur. The two groups of feathers are divided by a break similar to that which separates primaries and secondaries in the wing, but this may be an artificial condition due to the way in which the skin was prepared and dried. It is notable that all the quills of the "pelvic wing" are much more advanced in development than are any of the quills of the wings or tail.

When the main pterylosis of this young *Ectopistes* is compared with Nitzsch's figure of the condition in *Columba livia*, we find some striking differences. Dorsally, the upper cervical tract with its limiting apterium on each side and its conspicuous fork between the shoulders is fairly well marked but the branches of the fork are narrower, and the fork itself is deeper. The humeral tracts are evident but narrower than in *Columba*. The dorsal tract however, instead of having an insignificant apterium, a mere line at its center, is made up of two parts, separated from the cervical fork by a space of 5 or 6 mm. and from each other by a dorsal apterium 3 or 4 mm. wide; the two halves of the tract run nearly parallel to a point about 12 mm. anterior to the oil-gland when they curve inward slightly and unite in a short terminal part about 5 mm. wide, ending at the oil-gland. Each half of the dorsal tract is about four feathers, or 3 mm. wide near its middle, but is much narrower anteriorly. There is no trace of a femoral tract save the inner half of the "pelvic wing." The lower cervical, sternal and ventral tracts in the young *Ectopistes* are continuous as in *Columba* but are much narrower. The most striking feature however, is the complete separation of the two sides. In *Columba*, the lower cervical is a single tract only slightly forked where it joins the sternals, but in *Ectopistes* (*juv.*), the fork is so deep, reaching clear to the chin, that the lower cervical tract apparently consists of two entirely separated longitudinal tracts. It is possible that this separation has been accentuated by the way in which the throat has been stuffed in this particular specimen, but I think there is no doubt that in the living bird at this stage, the two parts were

separate. At the posterior margin of the sternum, there is a distinct notch on the *inner* side of each ventral tract, which seems to indicate the end of the sternal tract, widest just above the notch. It is not certain that this notch is not an artefact but I believe it would be at least indicated in the living bird. The ventral tracts end at the anus but scarcely surround it. There is no connection between the lower cervical or sternal tracts and the anterior end of the humerals.

The pterylosis of the adult Wild Pigeon has been determined by the study of two excellent alcoholic specimens. Certain features not clearly shown by one are easily distinguished on the other. The striking feature of the pterylosis is the extent to which the tracts cover the bird; the increase in their width during growth from nestling to adult is really extraordinary. Looking at the dorsal surface of the plucked bird the first impression is that there are no apteria but a closer inspection reveals a few small areas free from contour feathers and brings out the fact that the contour feathers are thickly placed on the main tracts and more sparsely distributed on the intervening spaces. The whole upper surface and sides of head and neck are quite uniformly feathered, somewhat sparsely on the occiput but quite densely on the neck. The fork of the upper cervical tract can be distinguished by its thicker feathering but there is no apterium between its halves or between it and the dorsal tract. There are no apteria either between the dorsal tract and the humerals but the intervening skin is uniformly, though not thickly, covered by contour feathers. The humeral tracts are wide and thickly feathered; just outside them there is, on each wing, an apterium about 25 mm. long by 8 mm. wide, running nearly parallel with the humerus. The mid-dorsal apterium is about 60 mm. long, 4 mm. wide at middle and tapering to each end. It is therefore relatively larger than in Nitzsch's figure of *Columba*, but it is greatly reduced (relatively of course) from the condition shown in the young *Ectopistes*. At the upper end of each femur there is a small apterium about 10 mm. in vertical length by 7 mm. in width. At the side of the pygidium, at the base of the outer rectrices is a still smaller space not quite 6 mm. square. All the rest of the dorsal surface is covered by the contour feathers of the dorsal and femoral tracts. The outer posterior

series of the femoral tract are composed of relatively large closely placed feathers and there are two or three widely separated series of three or four feathers each on the tibia, but one would never suspect the existence at any time of a "pelvic" wing so conspicuous in the young bird. The oil-gland itself is well developed, has the surface free from feathers, and lacks entirely a terminal tuft of small feathers.

Ventrally the apteria are more marked than on the upper side, yet the covering of contour feathers is very extensive. The two halves of the lower cervical tract are still separated by an apterium 4 mm. wide, as in the young bird, but contour feathers are now present on the chin and upper throat, so that they are united at their upper ends. The pterylosis of the neck in *Ectopistes* is thus very different from that shown for *Columba*, in Nitzsch's figure, for there are no lateral cervical apteria in *Ectopistes* and there is no lower cervical apterium in *Columba*. The sternal tracts in the Wild Pigeon cover the sides of the breast clear to the wings, connecting with the humeral tract above and extending far out on the humerus below; there is a small apterium on the side of the breast just beneath the head of the humerus. Posteriorly the sternal tracts run into the femorals on the side and extend upward to merge into the dorsal tract. There is a little triangular apterium, with sides about 8 mm. long, just anterior to the middle of the femoral tract, but excepting this space and the one at the upper end of the femur, the sides of the bird are entirely clothed in contour feathers. The sternals pass without a break or even a notch into the broad but short ventral tracts. These do not reach the anus nor do they meet each other clearly in the midventral line. Posterior to them is a rather large and distinct area, lacking contour feathers, but the lower side of the pygidium is well feathered. The ventral apterium is only 5 or 6 mm. wide over the crop, but becomes 20 mm. wide at the middle of the sternum and is 10 mm. wide on the belly.

The wing shows four well-developed feathers in the alula, ten long primaries and fourteen visible secondaries, but the "fifth" secondary is conspicuous by its absence! The relative length of the primaries is 9, 10, 8, 7, 6, 5, 4, 3, 2, 1. There are twelve rectrices, their relative lengths being 1, 2, 3, 4, 5, 6; i. e. the middle

pair longest, the outer shortest. Rectrix 1 is inserted almost directly above 2 but the others lie in the same plane. There are six major upper coverts on each side, but 6 is quite small and lies close beside 5 above rectrix 5, while covert 1 though large is pushed outward by the position of rectrix 1 and so lies nearly over rectrix 2. There are six major lower coverts but they lie beneath rectrices 2-5; covert 1 is largest and covert 6 is smallest.

The feathering of the lower part of the legs is sparse but continues down on the front of the tarsus 10-12 mm. Posteriorly the feathers do not extend over the joint.

If the above account of the pterylosis of the Wild Pigeon be compared with the account and figures of the pterylosis of the Columbidae given by Nitzsch, it is evident that *Ectopistes* has a distinctive arrangement of its feather tracts, of which the most striking character is their tendency to merge with each other. Comparison of the pterylosis of the adult and young Wild Pigeon reveals the highly interesting and important fact that the nearly uniform feather coat of the adult is not a primitive but a secondary condition, just as is known to be the case with the nearly uniform feathering of the ostrich. Perhaps the usual opinion that a uniform coat of feathers was the original condition from which specialized pterylæ have been derived, may prove to be a mistake.

SEXUAL SELECTION AND BIRD SONG.

BY CHAUNCEY J. HAWKINS.

THE place of song in the life of the bird has since the days of Darwin been a question of dispute between the scientists. Darwin was the first to deal with bird song in a satisfactory philosophical manner. He formulated the theory of sexual selection which down to the present day is still held by many ornithologists to be the most satisfactory explanation of the use of song as well as the best explanation of its evolution. He maintained that the males possessing the best song would naturally be the choice of the females; and that the song characteristics which had made a male the choice of his mate would naturally be handed on to his offspring, in other words, would become secondary sexual characters. This Darwin called sexual selection in distinction to natural selection whose operation had a wider scope.

To do Darwin justice we should state the theory in his own language; Sexual selection "depends on the advantage which certain individuals have over others of the same sex and species solely in respect of reproduction." . . . In cases where "the males have acquired their present structure, not from having transmitted this advantage to their male offspring alone, sexual selection must have come into action." . . . "A slight degree of variability, leading to some advantage, however slight, in reiterated deadly contests, would suffice for the work of sexual selection." . . . So too, on the other hand, the females "have, by a long selection of the more attractive males, added to their beauty or other attractive qualities." . . . "If any man can in a short time give elegant carriage and beauty to his bantams, according to his standard of beauty, I can see no reason to doubt that female birds, by selecting during thousands of generations the most melodious or beautiful males, according to their standard of beauty, might produce a marked effect." "It has been shown that the largest number of vigorous offspring will be reared from the pairing of the strongest and best armed males, victorious in contests over other males, with the

most vigorous and best nourished females, which are the first to breed in the spring. If such females select the more attractive, and at the same time vigorous males, they will rear a larger number of offspring than the retarded females which must pair with the less vigorous and less attractive males. So it will be if the more vigorous males select the more attractive, and at the same time healthy and vigorous females; and this will especially hold good if the male defends the female and aids in providing food for the young. The advantage thus gained by the more vigorous pair in rearing a larger number of offspring, has apparently sufficed to render sexual selection efficient."

Wallace was the first critic of the sexual selection theory. He admits that the display of gorgeous colors, the antics and songs of the male bird before the female, as fully demonstrated by Darwin but he says, "it by no means follows that slight difference in the shape, pattern, or colors of the ornamental plumes are what lead a female to give the preference to one male over another; still less that all the females of a species, or the great majority of them, over a wide area of country or for many successive generations prefer exactly the same modifications of colors or ornament." Thus he rules out the idea that the female makes a conscious choice of the male most highly colored or who is the best singer. But this does not destroy the idea that there may be an unconscious choice. Indeed, Wallace seems to admit this possibility when he says, "As all the evidence goes to show that, so far as female birds exercise any choice, it is of the most 'vigorous, defiant, and mettlesome' males, this form of sexual selection will act in the same direction (as natural selection), and help to carry on the process of plume development to its culmination." If this choice exercised by the female is unconscious rather than conscious, Darwin's theory is not vitally affected. All he is anxious to demonstrate is that the most vigorous bird succeeds in winning the most desirable mate, however the choice may be made, and if he succeeds in this the bird may pass to his offspring his own characters which in succeeding generations will become permanent.

But Wallace goes deeper in his criticism than the mere matter of choice. He attributes the origin of song to natural selection rather than to sexual selection. Darwin begins with sober colors

and attributes the gay colors of the males to selection on the part of the female. Wallace starts with the gorgeous colors and declares that the gray colors of the females are due to natural selection. Bright plumage would render the mother bird sitting on her nest conspicuous and make her the easy prey to hawks and other natural enemies. Hence all the highly colored females, through generations have been destroyed, only the more sober colored birds remaining. "The original brightness has been forfeited by the sex as a ransom for life. Female birds in open nests are similarly colored like their surroundings; while in those birds where the nests are domed or covered, the plumage is gay in both sexes."

The same principle of natural selection may be attributed to the call of birds. "These are evidently a valuable addition to the means of recognition of the two sexes, and are a further indication that the pairing season has arrived; and the production, intensification, and differentiation of these sounds and odours are clearly within the power of natural selection. The same remark will apply to the peculiar calls of birds, and even to the singing of the males. These may well have originated merely as a means of recognition between the two sexes of a species and as an invitation from the male to the female bird. When the individuals of a species are widely scattered, such a call must be of great importance in enabling pairing to take place as easily as possible and thus the clearness, loudness, and individuality of the song becomes a useful character, and therefore the subject of natural selection."

The increase and development of beautiful plumage is caused by the superabundant energy of the male bird. "During excitement and when the organism develops superabundant energy, many animals find it pleasurable to exercise their various muscles, often in fantastic ways, as seen in the gambols of kittens, lambs, and other young animals. But at the time of pairing male birds are in a state of the most perfect development, and possess an enormous store of vitality, and under the excitement of the sexual passion they perform strange antics or rapid flights, as much probably from the internal impulse to motion and exertion as with any desire to please their mates." So, also, "the act of singing is evidently a pleasurable one, and it probably serves as an outlet for superabundant nervous energy and excitement, just as dancing, singing, and field sports

do with us." If superabundant vigor can account for the songs and ornaments of birds "then no other mode of selection is needed to account for the presence of such ornament."

Brooks attacks the theory of Wallace that the duller colors of the female are acquired by natural selection. Thus there is found a difference in the colors of lizards where the female does not incubate and does not require the duller colors for the purpose of protection. In domestic fowl where danger from natural enemies is almost nothing the same difference in the color between the male and female continues. Thus the explanation is more fundamental than the one proposed by either Darwin or Wallace. Brooks bases his explanation upon a theory of heredity which supposes that the body gives off gemmules and that "the male reproductive cell has gradually acquired, as its special and distinctive function, a peculiar power to gather and store up these gemmules." The male cell, therefore, has acquired the power to transmit variation while the female cell keeps up the constancy of the species. "We thus look to the cells of the male body for the origin of most of the variations through which the species has attained its present organization." Darwin said that the plumage and song of the male bird were transmitted by the selection on the part of the female of the gayest bird and the best singer. Brooks goes deeper and finds the cause for these secondary sexual characteristics in the power of the male cell to transmit the variations. He does not deny that the female may choose the best singer but affirms that the male must lead in variations from his very nature.

Geddes and Thompson carry forward still further the criticism of Wallace and Brooks. Wallace accounts, on the theory of natural selection, for the dull colors of the female and for the more brilliant colors and song of the male. Darwin on the other hand rivets his attention upon the gorgeous colors, the plumes, combs and wattles of the male, accounting for them by the theory of sexual selection but fails to tell us why the same process does not brighten up the coat of the female. The mere statement of the position must make it clear that there is some deeper cause than that discovered by either Darwin or Wallace, some internal factor much more powerful in its operation than any external cause. Geddes and Thompson finds this in the essential difference be-

tween the sexes. "The females incline to passivity, the males to activity. The female cochineal insect "spends much of its life like a mere quiescent gall on the cactus plant. The male, on the other hand, in his adult stage is agile, restless, and shortlived." So with the other insects and other animals. The male is more active while the female is passive.

"For completeness of argument, two other facts may here be simply mentioned. (a) At the very threshold of sex-difference, we find that a little active cell or spore, unable to develop itself, unites in fatigue with a larger more quiescent individual. Here, at the very first is the contrast between male and female. (b) The same antithesis is seen, when we contrast the actively motile, minute, male element of most animals and many plants, with the larger passively quiescent female-cell or ovum.

"To the above contrast of general habit, two other items may be added, on which accurate observation is still unfortunately very restricted. In some cases the body temperature, which is an index to the pitch of life, is distinctly lower in the females, and has been noted in cases so widely separate as the human species, insects, and plants. In many cases, furthermore, the longevity of the female is much greater. Such a fact as that women pay lower insurance premiums than do men, is often popularly accounted for by their greater immunity from accident, but the greater normal longevity on which the actuary calculates, has, as we begin to see, a far deeper and constitutional explanation.

"The agility of males is not merely an adaptation to enable that sex to exercise its functions with relation to the other, but is a natural characteristic of the constitutional activity of maleness; and the small size of many male fishes is not an advantage at all, but simply again the result of the contrast between the more vegetative growth of the female and the costly activity of the male. So brilliancy of colour, exuberance of hair and feathers, activity of scent glands, and even the development of weapons, cannot be satisfactorily explained by sexual selection alone, for this is merely a secondary factor. In origin and continued development they are outcrops of a male as opposed to a female constitution. To sum up the position in a paradox, all secondary sexual characters are at bottom primary, and are expressions of the same general habit

of body (or to use the medical term, *diathesis*), as that which results in the production of male elements in the one case, or female elements in the other."

This essential difference between the two sexes which expresses itself in differences of plumage and song is further emphasized by the facts, first, that many of the secondary sexual characters appear only at sexual maturity. Thus some of the male birds are dull colored when young like the female and acquire the brighter colors only on full development. Again when the sex organs are removed by castration the male ornaments or weapons of battle disappear. In cattle castration reduces the size of the horns and after castration of the stag he never renews his antlers.

In the case of young cocks the effects of castration are very variable, sometimes increasing, sometimes decreasing the secondary sex characters. One result is clear, however, that the whole body is affected; the larynx is intermediate in size between that of cock and hen, the syrinx is weakly developed and the capons seldom crow or do so abnormally, the brain and heart are lighter in weight, fat accumulates in the subcutaneous and subserous connective tissues, and the skeleton shows many abnormalities.

The conclusion seems inevitable that neither Darwin nor Wallace reached the root of this matter. "The males are stronger, handsomer, or more emotional, simply because they are males, i. e. of more active physiological habit than their mates." This view does not wholly eliminate either natural or sexual selection. These may be limiting, and, in a sense, directive factors, but it is fundamentally the nature of sex which determines the gay color or the vigorous song.

To complete our review of this controversy which has been waged between ornithologists, we must record some of the more recent discussions of the Darwinian theory of sexual selection. Hudson says; "The result of such independent investigation will be a conviction that conscious sexual selection on the part of the female is not the cause of music and dancing performances in birds, nor of the brighter colors and ornaments that distinguish the male. It is true that the females of some species, both in the vertebrate and insect kingdoms, do exercise a preference; but in a vast majority of species the male takes the female he finds, or that he is

able to win from other competitors; and if we go to the reptile class we find that in the ophidian order, which excels in variety and richness of colour, there is no such thing as preferential mating; and if we go to the insect class, we find that in butterflies, which surpass all other creatures in their glorious beauty, the female gives herself up to the embrace of the first male that appears, or else is captured by the strongest male, just as she might be by a mantis or some other rapacious insect." He accounts for the singing of birds by the abounding energy of birds. "We see that the inferior animals, when the conditions of life are favorable, are subject to periodical fits of gladness, affecting them powerfully and standing out in vivid contrast to their ordinary temper. And we know what this feeling is — this periodic intense elation which even civilized man occasionally experiences when in perfect health, more especially when young. There are moments when he is mad with joy, when he cannot keep still, when his impulse is to sing and shout aloud and laugh at nothing, to run and leap and exert himself in some extravagant way. Among the heavier mammalians the feeling is manifested in loud noises, bellowings and screamings, and in lumbering, uncouth motions — throwing up heels, pretended panics, and ponderous mock battles."

This is simply a repetition of Herbert Spencer's surplus energy theory which was based on the earlier theory of Schiller who in his letters 'On the Æsthetic Education of Mankind' wrote: "Nature has indeed granted, even to the creature devoid of reason more than the mere necessities of existence, and into the darkness of animal life has allowed a gleam of freedom to penetrate here and there. When hunger no longer torments the lion, and no beast of prey appears for him to fight, then his unemployed power finds another outlet. He fills the wilderness with his wild roars and his exuberant strength spends itself in aimless activity. In the mere joy of existence, insects swarm in the sunshine, and it is certainly not always the cry of want that we hear in the melodious rhythm of bird songs. There is evidently freedom in these manifestations, but not freedom from all necessity. The animal works when some want is the motive of his activity, and plays when a superabundance of energy forms his motive when overflowing life itself urges him to action."

It is too superficial a theory to satisfy the modern mind. We are compelled to ask the question, why does the male bird have more surplus energy than the female? This question throws us back to a consideration of the fundamental difference between the male and the female. There is only one answer to that question. The male sings more vigorously because he is a male, in other words because there is some fundamental difference between the sexes.

Karl Groos has contributed one very serious modification of the Darwinian theory which has not been given sufficient consideration by ornithologists, namely, that the song and antics of the male bird are not for the purpose of compelling her choice by the female but to overcome and break down her instinctive coyness. Nature has given the female coyness as a dam to nature's impulses to prevent the "too early and too frequent yielding to the sexual impulse." A high degree of excitement is necessary to break this down and hence the necessity for all the vigorous songs and antics of the male.

I am confident that this theory is destined to find wider acceptance in the future than it has in the past, indeed, that a large part of the song of birds before the nesting season is for the purpose of breaking down the reluctance of the female rather than compelling her choice of a particular male. At Bakersfield, California, I spent an hour watching a male Flicker sitting on a small limb a foot or more above his mate while both birds went through motions that were interesting and at times almost ludicrous. The proud male would extend his head in a line with his body, then turn both body and neck first to one side and then the other, like a weather vane hung on a central shaft, at the same time jerking his head back and forth in a sort of kick-up motion, and pouring out all the time a quick succession of notes which might be represented by the words *pick-up, pick-up, pick-up*, closing the whole performance by a right-about-face, when he would rest a minute and repeat the process. His less gaily colored mate was not so vigorous in her antics as her proud lord nor did she indulge in them so frequently but it was evident that he was making his impression and she could not refrain from expressing her feelings. I was certain that these birds had mated their lives "for better, for worse." Hence the love song could not have been for the purpose of mating but to

furnish the necessary excitation to make productive the season that was at hand for the reproduction of their race. There is no other explanation that can be given for birds already mated, unless it be that of the overflow of superabundant energy and this is too superficial an explanation for the deep laid plans of mother nature. Were this the only cause for the songs and antics of birds the mere overflow of nature might never terminate in anything or it might lead to unregulated abuse. But nature protects and regulates her ways by safety valves, of which the reluctance of the female is one, and this must be overcome before the reproductive process can become effective.

This view seems to be strengthened by the fact that the display of song and antics is used by polygamous birds and animals as well as by those which mate for the season or for life. The rooster with his harem about the barnyard is just as vigorous in his performances as the bird which is devoted to his single mate. The doe in her breeding time calls to the buck who rushes to her side, then she, "half in coyness, half in mischief, takes to flight at his eager approach, makes towards an open space, and runs in a circle. The buck naturally follows, and the chase grows hot and exciting as a race of horses on a track. To the frequent high calls of the fleeing doe are added the deep, short cries of the panting buck; but suddenly the roguish doe disappears like a nymph into the thicket near at hand, and the baffled buck stands with head erect and ears thrown forward; then we see his head lowered as he catches the scent, and he too vanishes in the wood." But this deer is a polygamist and his antics cannot be for the purpose of mating.

Watch the finch as he dances about his mate, fairly losing himself in a frenzy of ecstasy, flashing his wings in a wild delight and prancing about and chattering, the antics of the noisy street sparrow, the prancing and cooing of the pigeons, and there is only one evident conclusion. It is not for the purpose of mating but the more immediate purpose of hastening the female to fulfill her natural function. There are times when two or more males are involved in these antics, in which case there must be at least an unconscious choice on the part of the female, or a battle royal which will drive the competing males away, but in the vast majority

of cases there is only one ardent male bird in the presence of the female and he is often the bird with which she has already mated.

A weakness of the sexual selection theory that has not been given sufficient consideration is that the song of birds has been treated too exclusively in connection with the mating season. Men have riveted their attention on those rapturous bursts of song which precede and continue through the mating time, and have given too little attention to the fact that few birds are ever wholly voiceless, that most birds speak the sign or voice language, at least to some extent, all through the year.

Most of our best singers have two distinct song periods. One begins with the arrival of the advance guards of the migrating hosts and continues until the broods of young birds are hatched. When the young birds have left the nest and are able to care for themselves there is a cessation of the full, joyous songs, September being generally the silent month. Then many of the birds begin to sing the last of September or the first of October and continue until November. Bicknell has determined definitely the limits of these song periods for many of our birds. The House Wren begins to sing its love song in April and continues to the last of July or the first of August. After a period of comparative silence it begins its autumn song which has none of the spontaneity of the spring song but consists of a "low rambling warble" which continues to the middle of October. The Black and White Creeping Warbler sings from April to the late June. Its second period begins from the ninth to the twenty-second of August and lasts only a few days. The first period of the Oven-bird stops by the end of June. The second period begins in August, at first haltingly, as though it had forgotten how to sing, but finally bursts into full song by October. The Wood Thrush sings from its arrival in late April or early May until the middle of August. It is not heard again until October and then only the call notes, never the full song.

Bicknell attributes this period of silence to the moult of the bird. In many cases the moulting periods of our song-birds correspond more or less closely with periods of silence, voice being renewed with the renewal of plumage. The general statement may therefore be made, that birds are predisposed towards silence during the height of the moult. Though this fact may by many be regarded

as one not requiring demonstration, it is by no means without exceptions. In the earlier and later stages of the moult the vigor of the birds in general seems little impaired. Not only do many species enter on their migrations while yet the moult is in progress or before the complete maturity of their renewal plumage but birds may be found sitting upon their eggs with evident indications of activity on the growth of feathers. Still we must regard it as a general fact that singing and moulting are in some degree complementary.

Some birds have no second song period. The Catbird sings from April through July but it is not heard in the autumn. The Brown Thrasher sings from April to the first week in July but is silent in October. After August the Scarlet Tanager is not heard again in full song. Where this second period is lacking it is probably due to the excessive fatness of the bird. Thus the Scarlet Tanager undergoes its moult in August. The growth of the new feathers continues until October when the bird becomes very fat. The Wood Thrush moults in August but is not fat. By the last of September its plumage is nearly perfect and the bird is fat. Hence the song seems to be interrupted first by the moult and then by the adipose condition.

There are some cases where the birds' best song is outside of the mating season. It is a significant fact that the male birds arrive first in the migration and soon after their arrival begin their full song though there are no females to hear. It may be said this is for the purpose of attracting the females on their arrival or that the male is practising his art but this seems too superficial an explanation. There must be something within the bird himself which causes him to sing though there is no ear to listen. Hudson calls attention to a small yellow field finch of La Plata which does its best singing in August. These birds gather in great flocks in the tops of trees and sing in concert, producing a "great volume of sound, as of a high wind when heard at a distance." Later this choir breaks up, love infects the individuals, and they scatter over fields and pasture lands. But during courtship the male has only a feeble, sketchy song.

There are birds which sing more or less the entire year. Hudson found several birds in Patagonia with good voices, one a mocking-

bird, which were autumn and winter songsters. Olive Thorne Miller tells of a Gray-checked Thrush in captivity which sang all winter. "All through the long winter this charming thrush, with his two neighbors delighted the house with his peculiar and matchless music, and endeared himself by his gentle and lovely disposition. No harsh sound was ever heard from him, there was no intrusion upon the rights of others, and no vulgar quarrels disturbed his serene soul." (In *Nesting Time*, pp. 168-169.) The voice of the Crow is as vigorous in January as in June and while I write these lines, in February, a Blue Jay is screaming from a tree in a neighbor's yard as though April had come. The Chickadee sends out his cheery song the coldest day in winter with almost as much vim as he does in the nesting time. The metallic notes of the Flicker ring over the hill sides through the coldest months with a vigor becoming the hardy bird. Indeed, the man who goes forth into the New England hills in winter, especially if the sun happens to be shining brightly, must be impressed by the number of bird notes he will hear during the day. I went forth one day in January when the earth was encased in ice, over which was a thin layer of fluffy snow. A strong wind was blowing, whipping the bare branches of the trees. The thermometer was low and the air stinging, surely as unfavorable a day as one could find for birds. What was my delight to find a large flock of Robins and another of Goldfinches. The latter were as active and cheerful as though it had been a day in May. Defying the wind, they were in the tree tops, swinging on the tips of the branches, sometimes hanging up side down, hunting eagerly for food. And from the tops of the trees their sweet, unobtrusive notes dropped down like bubbles of melody floating leisurely through the air. They were such a friendly company, no one showing jealousy because another had been more fortunate in finding food. Their concert of song was a free expression of their genial disposition, some birds uttering only single notes while others rolled out three or four syllables. I never heard a more hearty Goldfinch chorus in the spring than they uttered on this cold January day, except it was not quite so loud as in April. The Robins showed more effect of the cold weather, sitting on a branch with their feathers fluffed out, as though to increase the size of their feather coat, but with all their discomfort

they too indulged in song. Most of them gave the single Robin note but occasionally a more ambitious bird would roll out a longer phrase, one bird answering another that called from a distant tree. Then the entire flock would rise on wing, chirping as they flew, as though glad they were living and could not withhold an expression of their joy. From the top of the pines the Crows cawed at each other, tipping their bodies as they called in a tilting motion, and protruding their necks and heads with each note.

The fact that is too seldom taken into consideration is that while the bird usually sings his most vigorous song and indulges in his most frantic efforts around the nesting season, he does use his voice at other times during the year, that there are few birds that are entirely voiceless at any time. Sometimes he utters only a call note, again the note of alarm, caused by sudden flight, while again he sings apparently only for the pure joy of living. But throughout each month of the year either a sign or spoken language plays a part in the ceremony of his existence. His song is not merely a thing related to his sexual life. It has a relationship to his total existence. It is no more to be explained by the principle of sexual selection than is the existence of the human voice, even in its higher and finer modulation, by the same law. It is the means by which the bird expresses himself to the outer world. It is used according to the need of the hour or the season, the instrument by which the bird communicates his needs or feelings.

It is significant in this connection that so little has been said concerning the voice of the female. The question may reasonably be raised whether her voice is not much more important in nature's scheme than that of the male. He is a much more ardent, vigorous and accomplished singer. But after all that can be said about his song the fact remains that it is not so very important. It is a sort of grandstand performance. He is a sort of troubadour who comes forth to please those who hear but it contributes nothing we can see toward the protection or rearing of the young. But who that has listened to the sweet, low notes of the mother to her young or the alarm notes or clucks which cause her helpless brood to run to hiding, can doubt that the voice of this female is very important in the struggle for existence. If the purpose of selection is the improvement of the race why might not some genius show that

the males select the mate with the best cluck or call for the protection of her brood? It would certainly be a theory far more in harmony with nature's plans. But, while no person would probably have the courage to prove such a theory, it cannot be doubted that the female has a language and that it is far more important in the preservation of the race than the more modulated language of the male.

All of these facts must be taken into consideration before we can adequately account for the song of birds. The sexual selection theory is based too exclusively upon one period in the bird's life. The bird has more than one season of song and there is no month of the year when his voice does not play some part in his life. The female has a language as well as the male. It must be evident that any explanation which will be adequate to account for bird language must cover every season and must be found in the inner life of the bird rather than in outward circumstances or choices.

Again there are certain types of sign language which are much more universal among birds than has generally been assumed. Much emphasis has been placed upon the displays and love dances of pheasants and birds of paradise which, it has been assumed, was the cause of the beautiful plumage of these birds. The female choosing the best performer or the most highly colored male has resulted through slight modification, generation after generation, in these elaborate decorations. But we have, since Darwin, discovered that the love dance or display is in some measure used by many birds, often birds of dull color, like the English Sparrow, and they are still, in spite of the love dance, dressed in gay or sober plumage. Howard, in his remarkable 'History of the British Warblers,' has shown "that these birds of sober hues perform during moments of sexual exaltation, antics which in every way reflect the display supposed to be peculiar to birds of brilliant plumage." Savi's Warbler, also, indulges in these antics even when feeding his young. Furthermore, these dances are not confined to the period of courtship.

From whatever point of view we approach this subject the evidence is so strong that we are compelled to look for our explanation in the internal life of the bird rather than in any external, exciting cause. Most of the theories thus far set forth have in

them an element of truth. If the purpose of song is excitation of the female to break down her coyness, this very act may compel her to exercise an unconscious choice and thus sexual selection may exert a limiting and directive force in the life of the bird. Even Hudson's theory that the bird sings out of the abundance of its very being, joy and life, is not to be ignored. But the question forces itself upon us, why does the bird sing and dance to overcome the female coyness and what gives the male more vitality than the female? The answers to these questions force us back into the inner life of the bird to seek our answer in the essential difference between the sexes.

So far as song, as well as other displays, in the mating season are concerned they are due to the ripening of the sexual glands from which, as Pycraft has shown, hormones "are set free, and, pervading the body, stimulate the nervous system, and at the same time the secondary sexual characters — the antlers of the stag, the mammary glands of the female, the 'breeding plumage' of the bird. When they are obviously secondary sexual characters, as in the case of dull colored birds, the result is the same, a state of physical exaltation expressed in 'display.' Males or females wherein these 'hormones' are but feebly developed, display and respond indifferently, and so cease to please the opposite sex. As Mr. Howard has pointed out, in the case of the Warblers, no amount of display on the part of the male will avail until the female has attained a like pitch of preparedness for the work of procreation. The courtship of the ruffs and reeves, already referred to, afford another illustration. Here it will be remembered the males for weeks spend laborious days in endeavoring to gain some responsive sign from their prospective but phlegmatic mates, yet without receiving the slightest sign of encouragement or recognition. As soon, however, as the female has become 'sexually ripe,' as soon as the hormones secreted by her generative glands have done their work, she herself indulges in a species of nuptial dance, waltzing round her lord, and setting down before him with her tail directed toward his head. Thus the sexual activity displayed by the male comes to mean simply that he is more ardent at this time than his mate. The advantage of this is obvious: for thereby the more vigorous males, by proclaiming their desire to pair, defeat their

less vigorous rivals, who might otherwise be chosen. The earlier they can take the field, the more persistent their advances, the greater their chance of ultimate success, and this because they slowly instil a preference which cannot be overcome by later and less virile comers."

This fact makes it clear why many of the sober tinted birds are as ardent in their love dances and displays as some of the more brilliantly colored birds like the peacock and the pheasant. It may also explain why some of the more beautifully colored birds sing as vigorously as the duller tinted species. Their nervous system is in a condition of intense stimulation through the action of secretions thrown off by the sex glands. But the important fact is that it completely modifies the theory of sexual selection, so modifying it that there is little of the significance attributed to it by Darwin and his followers remaining. The antics, display and songs of birds are germinal variations which have survived and are not the result of conscious or unconscious choice on the part of the female. This is "borne out by the fact that birds of the most sober hues affect displays of a character precisely similar in kind to those of birds in which this display appears to be made for the sole purpose of exhibiting to the best advantage some specially modified or beautiful colored feathers."

This view which seeks the cause of song in the internal life of the bird rather than in external causes, also gives a more satisfactory view of the total language of the bird, the call and alarm notes, the gentle notes of the mother bird over her young and the songs that are uttered outside of the mating season. The sexual selection theory has fallen down, in my judgment, from the fact that it has confined itself too exclusively with one short period in the language of the bird. It has failed almost exclusively to recognize that birds have a language which extends throughout the entire year, either sign or tone language, and that there must be something in the feathered creature which will account for this less vigorous expression of life and needs which occur outside of the mating season. It is here that the theory of germinal variations comes to our assistance. Voice having originated in the hisses and groans of the reptile, it was inevitable that there should be a difference both of tone and vigor between the male and female

birds, due to the essential difference of sex and any variations in voice which might arise would be preserved in the male germ which assures the variation in the species while the germ of the female guarantees the constancy of the species.

SOME ADDITIONS AND OTHER RECORDS NEW TO THE ORNITHOLOGY OF SOUTH CAROLINA.

BY ARTHUR T. WAYNE.

SINCE 'My Birds of South Carolina' was published in 1910, I wish to announce the addition of four species new to the fauna as well as the noteworthy capture of many birds, and the early breeding of Bachman's Warbler. Information of this kind is gained slowly, and requires constant, if not daily, exploration of fields, forests, and water areas.

Puffinus griseus. SOOTY SHEARWATER.—A specimen of this species was picked up dead on the beach of Bull's Island on, or about, the last of May, 1916, by Mr. Clarence Magwood. I examined the bird about a week after it was found. This date probably represents the time when the birds make their appearance in the spring on the South Carolina coast.

Histrionicus histrionicus. HARLEQUIN DUCK.—During the intensely cold weather which began on December 30, 1917, and continued through the third week of January, 1918, I was constantly on the lookout for far northern birds. On January 14, I saw four of these ducks, and on the 16th, I saw two more near the place where the first were seen on January 14. These ducks were probably not more than 75 or 80 yards from me and the identification was established without a doubt despite the fact that I was unable to shoot one. All the examples were in the plumage of the female and must have been that sex or else young males of the first winter plumage. Near at hand were small flocks of Buffle-head (*Charitonetta albeola*), Old-squaw (*Harelda hyemalis*), and Ruddy Ducks (*Erismatura jamaicensis*), and the Harlequin's were easily identified. This is an addition to the avifauna of South Carolina.

Chen hyperboreus hyperboreus. SNOW GOOSE.—On October 16, 1916, Mr. Lucian L. Porcher shot on Porcher's plantation, Christ Church

Parish, a beautiful young female of this species and gave it to me, which is now in my collection. This specimen is very small and scarcely larger than Ross's Snow Goose (*Chen rossi*). The form of the Snow Goose that was known to occur in South Carolina was the Greater Snow Goose (*Chen hyperboreus nivalis*), therefore the capture of *C. h. hyperboreus* is an addition to the ornithology of South Carolina.

Chen caerulescens. BLUE GOOSE.—Among a small collection of birds at the Santee Gun Club, Santee River, is a fine specimen of this bird, being shot on the preserves of the Club by Mr. Frank Carnegie, and presented by him to the Club. Mr. Carnegie shot this goose about ten years ago. This is another addition to the fauna of South Carolina.

Herodias egretta. EGRET.—On December 18, 1917, I saw a beautiful specimen of this bird flying near at hand over a frozen pond near my home. Heretofore I have not observed this species later in the autumn than the first week in November, for this bird is susceptible to cold. I could easily have procured it, but as I never molest them at any season, hoping for those remaining to increase, I let it remain. I, however, did not observe it again after the intense cold, beginning on December 30, and which lasted uninterruptedly until the third week in January, 1918, therefore the bird undoubtedly migrated.

Nyctanassa violacea. YELLOW-CROWNED NIGHT HERON.—A most exquisite specimen of this heron that I shot on October 5, 1916, according to Mr. Ridgway's 'Color Standards and Color Nomenclature,' 1912, has the back, wings and upper parts (exclusive of head) 7 Deep Gull Gray, while the under parts are near to the shade 8 Gull Gray. The forehead, crown, and occiput are white or yellowish white in which are numerous chestnut or reddish brown feathers. Although this lovely bird is in fresh, unworn, autumnal plumage the occipital feathers and the long dorsal plumes of the supposed breeding plumage are present and as perfectly developed as in the latter season. The specimen is the largest I have yet seen or taken, and my experience with this bird goes back to 1884. I realized as soon as I saw it near at hand that it was the most beautiful example I had ever seen.

Numenius hudsonicus. HUDSONIAN CURLEW.—On December 11, 1917, while I was *en route* to Long Island (Isle of Palms) in search of Ipswich Sparrows (*Passerculus princeps*) I heard, then saw, a Hudsonian Curlew near Bullyard Sound (Santee Path). The case was so novel that I could scarcely believe my ears and eyes, as the latest record upon which I had detected this bird in the autumn was October 2, 1885, when I shot two on Sullivan's Island. I determined to obtain this bird, as the desire of possession of a *winter* example was most keen with me!

The bird was very shy and flew about a half mile to an adjacent sound where I marked it in a superficial manner. About this time the wind began to blow hard from the northeast with about freezing temperature. I followed this bird from place to place and, after firing six shots at it at long range, I finally secured it with a heavy charge on my seventh shot.

The specimen was not crippled, being very fat and very wild, and is in fine, unworn plumage. Although Audubon¹ says that "I once saw a large flock of them near Charleston, in the month of December," he must have confused this species with the Long-billed Curlew (*Numenius americanus*) which latter bird wintered along the South Carolina coast in vast numbers up to 1885 or a few years later.

Arenaria interpres interpres. TURNSTONE.—On May 30, 1918, I shot on Dewees Island five birds at one shot and from the same flock, all of which are in perfect nuptial plumage. One specimen — an adult male — having more black in the upper parts than any individual I had previously taken led me to compare it with an European specimen, Mr. J. H. Riley having sent me an adult male from the U. S. National Museum collection taken at Havre, France, on May 15, 1875. This French bird has the wing $5\frac{7}{8}$ inches, and the wing of the South Carolina specimen is of the same length. According to 'The Water Fowl Family' Dr. Bishop gives the wing measurement for *A. interpres* as more than 6 inches, and for *A. interpres morinella* as under 6 inches. The South Carolina bird is identical in coloration with the European except that it has more reddish in the wing-coverts; and if *interpres* is really distinct from *morinella* (which is doubtful, as a typical *morinella* in coloration has the wing more than 6 inches) an European bird has been added to the fauna of South Carolina. Ruddy Turnstone's, i. e. males in perfect nuptial plumage, vary endlessly in the amount of black in the upper parts. A lovely male taken by me on May 26, 1910, has very little black on the upper parts, the reddish color everywhere prevailing. The specimen taken May 30, 1918, that is referable to *A. i. interpres*, has two coal black feathers among the white feathers of the abdominal regions.

Falco columbarius columbarius. PIGEON HAWK.—While watching a pair of Rough-winged Swallows (*Stelgidopteryx serripennis*) building a nest in an ancient limekiln from which a round limb had rotted leaving a long, round symmetrical hole, in which the Swallows were depositing pieces of sedge on May 15, 1918, a Pigeon Hawk attacked and caught a Barn Swallow (*Hirundo erythrogastra*) with superlative ease and flew with it first to the beach then to a high, dead pine about 400 yards away. I hastened to the tree hoping to secure it; but as I was almost in proper range the hawk which had already devoured the swallow flew to such a distance that I could no longer follow it with my eyes.

The Pigeon Hawk is now a very rare bird on the coast of South Carolina and has always been very rare in the spring, the last time I observed one was on April 13, 1900, an adult male in beautiful plumage, that I shot, and which is now in my collection.

Myiarchus crinitus. CRESTED FLYCATCHER.—On December 11, 1914, I heard the note of a Crested Flycatcher and upon following the

¹ Birds of America, Vol. VI, 1843, p. 42.

sound found the bird perched upon a tall water oak tree in a large forest. Although the ponds were frozen over this bird was calling as though it was the month of May or June, and it was indeed an anomaly! I collected the bird. The specimen is in fine, unworn plumage and was very fat. Had I not shot this bird it would have undoubtedly wintered. It is now in my collection.

Quiscalus quiscula æneus. BRONZED GRACKLE.—I shot on March 14, 1918, a superb adult male of this bird near Mount Pleasant. I was following some Florida Grackles through a large dense swamp trying to collect a large male, but the birds were so wild it was difficult to get within range. At last I hid behind a large tree and a large bird came within range which I promptly shot. Upon securing it I was surprised to find that I had at last taken a Bronzed Grackle, which is an addition to the fauna of the coast.

The Bronzed Grackle is without doubt a *species*, as I cannot find any intergradation among specimens taken from South Carolina to Kansas.

Quiscalus quiscula quiscula. CAROLINA GRACKLE.—The type locality of this Grackle is stated to be South Carolina founded on *The Purple Jack Daw*, *Monedula purpurea*. Catesby, Nat. Hist. Carolina, I, 1731, 12, pl. 12, in Linnæus' Syst. Nat., ed. 10, I, 1758, 109.

An examination of the text of Catesby's book, however, proves conclusively that the birds to which he refers were in reality the Florida Grackle (*Quiscalus q. aglæus*). Catesby's birds undoubtedly came from the coast of South Carolina. He says: "They make their Nests on the branches of trees in all parts of the country, but most in remote and un-frequented places; from whence in Autumn, after a vast increase, they assemble together, and come amongst the Inhabitants in such numbers that they sometimes darken the air, and are seen in continued flights for miles together, making great devastation of grain [rice] where they light." The Florida Grackle belongs strictly to the region near or adjacent to the coast, but always avoiding salt water; its nest is invariably built in trees or in low bushes over water, but never in woodpecker holes or in natural cavities of trees. The Florida Grackle therefore becomes the type of the genus with the type locality fixed as the coast of South Carolina, and I suggest the name of Carolina Grackle for the species.

This will leave the Purple Grackle without a name, the earliest available one seems to be *versicolor* Vieillot, Nouv. Dict. d'Hist. Nat., XXVIII, 1819, 488 (North America). The name of the Purple Grackle will therefore be *Quiscalus quiscula versicolor* Vieillot, and the Carolina (i. e. Florida) Grackle, *Quiscalus quiscula quiscula* Linnæus.

Passerculus princeps. IPSWICH SPARROW.—I made three trips to Long Island (Isle of Palms) in the autumn and winter of 1917 and each trip represented a walk of fifteen miles over low sand hills. It was not until my last visit on December 28 that I was able to detect even one of these birds which was secured after a long chase. This bird, although a young male of the year, has the supercilary stripe marked somewhat

strongly with canary yellow. It was also undergoing a moult embracing the head, jugulum and upper breast feathers.

Passerherbulus lecontei. LECONTE'S SPARROW.—In 'Birds of South Carolina,' 1910, page 120, I expressed my belief that many of these birds remain until April. During the past winter of 1917-1918 Leconte's Sparrows were present in considerable numbers. As usual fires were of a daily occurrence on account chiefly of a long protracted drought so that fields of broom grass, as well as dense forests, were completely burned over. I, however, succeeded in saving a field of broom grass near my home, which embraced about ten acres, from the flames. In this field I procured specimens in March and April as follows: March 22, one; April 4, one; April 17, one undergoing a spring moult was taken; April 27, one in very worn plumage was secured. Of the series of thirty-one birds taken only five were males, which was the case in the winter of 1893-94, when the birds were here in great numbers, showing that the males remain farther north.

Lanivireo solitarius alticola. MOUNTAIN SOLITARY VIREO.—On January 11, 1912, I secured a perfectly typical example of this large race near Mount Pleasant. The specimen is an adult male and the taking of it in January shows that a few sporadic individuals must winter regularly here.

Vermivora bachmani. BACHMAN'S WARBLER.—I found on March 28, 1918, on the extreme northeastern edge of I'On Swamp, near Witherwood plantation, a nest containing *five* eggs of the rare Bachman's Warbler. These eggs were incubated for at least five or even seven days and show that, although this bird does not winter, it arrives very early in the spring and breeds even much earlier than the resident Pine Warbler (*Dendroica vigorsii*) and Yellow-throated Warbler (*Dendroica dominica*).

Dendroica magnolia. MAGNOLIA WARBLER.—On October 10, 1915, I shot a young male of this species about 300 yards of the spot where the first one for the coast region was taken on September 29, 1912, and recorded by me in 'The Auk,' XXX, 1913, 277. It is evident that the Magnolia Warbler migrates in small numbers along the coast of South Carolina, in the autumn.

Dendroica virens. BLACK-THROATED GREEN WARBLER.—The brief account of this bird written in 'Birds of South Carolina' is, in the main, correct. Although I had never found it breeding when the book went to the press I was absolutely certain that it really bred on the coast in widely separated places due to the presence of original heavily timbered forests, which is requisite for the birds in the breeding season. And the reason for not stating that the birds breed here was that I respected the opinion of other persons whose views did not coincide with mine. On April 11, 1917, however, I found a female building a nest in a tall pine tree in I'On Swamp, and on April 25, 1918, I saw another female carrying nesting materials, but could not locate the place by following her, as the swamp was too dense. According to Mr. Loomis the birds breed in the mountains of Pickens County and also at Caesar's Head, Greenville County

(see Auk, VII, 1890, 128, and VIII, 1891, 331). As far as I am aware, after searching the literature on the breeding range, there is no breeding *maritime* record south of Long Island, New York, which is nearly 600 miles northeast of the region where the birds breed on the South Carolina coast. This is indeed truly remarkable.

Oporornis agilis. CONNECTICUT WARBLER.—Misses Louise Petigru Ford and Marion J. Pellew saw at Aiken on May 12, 1915, an adult male on the ground among highland ferns. These ladies watched this bird for a long time through powerful opera glasses and no mistake whatever was made by them, as they are familiar with the resident as well as migratory birds found about Aiken. The Connecticut Warbler is very rare in the spring east of the Alleghenies. Mr. Loomis took one at Chester on May 10, 1889, but I have yet to take one in South Carolina.

LIST OF BIRDS COLLECTED ON THE HARVARD PERUVIAN EXPEDITION OF 1916.

BY OUTRAM BANGS AND G. K. NOBLE.

THE birds listed in the following notes were collected by one of us — Noble who accompanied as naturalist the Harvard Peruvian Expedition of 1916.

This was a short summer vacation trip, financed by friends of the Museum of Comparative Zoölogy, into the northwestern corner of Peru. Roughly speaking the expedition covered a triangular course from Payta to Tabaconas and thence out to the coast again at Chiclayo. The regions traveled were mostly desert or semi-desert ones; at a few places only was real sub-tropical forest met with.

A careful itinerary by Noble will be published later with his account of the Reptiles and Batrachians, upon which he was working when he answered the call to the service of his country in war.

For the loan of, often very necessary, specimens we are much indebted to Dr. Chas. W. Richmond of the United States National Museum, Dr. Frank M. Chapman of the American Museum of

Natural History, Mr. W. E. Clyde Todd of the Carnegie Museum, Mr. Chas. B. Cory of the Field Museum of Natural History and Mr. T. E. Penard of Arlington, Mass.

Phalacrocoracidæ.

Phalacrocorax vigua vigua (Vieill.). One ♀, Perico, September 14.

Falconidæ.

Polyborus cheriway cheriway (Jacq.). One adult ♀, Perico, September 14.

This specimen agrees, with two others — one from Punto Caiman, Santa Marta, Colombia, one from Rio Caura, Venezuela — kindly let us by W. E. Clyde Todd of the Carnegie Museum. The bird of northern South America, as shown by the three skins now before us, two of which are fine adults, is clearly different from the North American Caracara.

The South American form is much more intensely black, less brownish black, is slightly smaller throughout and has a shorter, and more feeble bill.

We would therefore suggest the large, heavy-billed, brownish black North American bird, be known as

Polyborus cheriway auduboni Cassin,

based upon Audubon's Florida specimen, which Audubon presented to the Academy of Natural Sciences of Philadelphia. This form occurs in Cuba, and on the mainland ranges from northern Lower California, Arizona, Texas and Florida south to Panama. Skins from Panama differ but little from those from northern localities, and are decidedly referable to *P. cheriway auduboni* rather than to *P. cheriway cheriway* (Jacq.).

The Caracara was observed throughout most of the lowlands. Along the Upper Piura River Valley Caracaras were very abundant. Several were nearly always to be seen in the vicinity of every clearing.

Ibycter megalopterus (Meyen). One adult ♂, Lake Warinja, August 18. This bird was seen only at the highest altitudes visited, the single specimen was secured at about 9000 feet.

Accipiter bicolor bicolor (Vieill.). Five specimens, immature of both sexes, and one adult ♀, Perico and Bellavista, September.

Chapman, in 'The Distribution of Bird-Life in Colombia,' p. 242, does not recognize a western form of this hawk, *A. b. schistochlamys* Hellmayr, and the series of twelve skins in the Museum of Comparative Zoölogy wholly supports what he has said.

The present specimens agree in color with skins from Panama and Costa Rica and even with those from so far north as Quintana Roo. There is, however, a gradual increase in size northward and examples from Vera Cruz — practically, the northern limit of the species, — are very large. The one adult female we possess from this State is besides much darker in

color than any from farther south, and for this large dark northern form, we propose the name —

***Accipiter bicolor fidens* subsp. nov.**

Type from Buena Vista, Vera Cruz, Mexico, fully adult ♀, No. 2289 Bangs Coll. (in Museum of Comparative Zoölogy). Collected June 14, 1901, by A. E. Colburn and P. W. Shufeldt.

Characters. Larger and darker than *A. b. bicolor* (Vieill.), upper parts blackish slate, under parts slate gray. Type ♀ ad., wing, 260; tail, 209, tarsus, 67; culmen from cere, 20.5. Topotype, No. 2290, ♀ immature, wing, 255; tail, 212; tarsus, 68; culmen from cere, 18.

Only one of the five specimens in the series contained food in its crop. This consisted of five or six large cockroaches.

Heterospizias meridionalis (Lath.). One young (♂?) with the under tail coverts still in down, Perico, September 16.

Rupornis magnirostris occidua Bangs. Ten specimens, one immature ♀, and adults of both sexes. Bellavista and Perico, September.

These skins are very uniform in character and agree exactly with the type. Compared with a fine series of true *R. magnirostris* from Paramaribo, Surinam, kindly lent us by T. E. Penard, they are very different.

By far the commonest hawk met with throughout the Valley of the Marañon and Chenchipe was this species, but the bird was not seen to the west of the Andean range.

The crops and stomachs of the ten specimens collected contained the following variety of food:

4. Burrowing Snakes (*Glauconia*).
1. Burrowing Lizard (*Bachia*).
2. Mice.
1. Chilopod.
1. Grasshopper.

***Herpetotheres cachinnans maestus* subsp. nov.**

Two females, one immature, one adult Bellavista and Perico, September.

Type from Bellavista, Peru, adult ♀ No. 80152 M. C. Z. Collected September 19, 1916, by G. K. Noble.

Characters. Size small, and under wing coverts heavily spotted as in *H. cachinnans fulvescens* Chapman of western Colombia, but with the under parts very much whiter — buffy white. Similar also to *H. c. cachinnans* (Linn.) of Guiana, but smaller; the under wing coverts more heavily spotted, and the underparts paler — whiter.

Measurements.

No.	Sex.	Locality.	Wing.	Tail.	Tarsus.	Culmen from Cere.
80152	♀ ad.	Bellavista	235.	185.	67.	21.
80151	♀ imm.	Perico	229.	169.	69.	23.

All of the Crying Falcons observed were found in the immediate vicinity of the river beds. They were very fond of remaining perched throughout most of the day upon some tall tree which commanded a wide stretch of the river valley.

One of the specimens collected contained in its crop a large Chilopod, *Scolopendra gigantea* (Linné) and the legs of a lizard (either *Stenocereus* or *Liocephalus*).

Chondrohierax¹ uncinatus megarhynchus (Des Murs). Two adults, ♂ and ♀, Bellavista, September 24.

Our specimens have larger bills than any in a considerable series of skins from eastern South America, still they fall somewhat short of the maximum measurements given for true *megarhynchus* and are probably intermediate between that form and *uncinatus*. They afford the following measurements.

No.	Sex.	Wing.	Tail.	Tarsus.	Culmen from Cere.
80153	♂ ad.	282	188	36.	34.
80154	♀ ad.	303	211	38.5	35.

Probably a breeding pair taken together in a wood near the banks of the Marañon. The gonads were well developed in both.

Falco deiroleucus Temm. One adult ♀, Perico, September 7. This bird is one of a pair that had a nest on a high tree upon which she was perched when shot. The tree was near the border of a vast stretch of tropical arid lands.

Cerchneis sparverius caucæ Chapman. One adult ♂, Sullana, August 1. Only seen in the dry coastal deserts, where it was decidedly uncommon.

Tinamidæ.

Crypturellus tataupa inops subsp. nov. Three adult males, Bellavista and Perico, September.

Type from Perico, northwestern Peru, adult ♂, No. 80123 M. C. Z. Collected September 10, 1916, by G. K. Noble.

Characters. Similar to true *C. tataupa* (Temm.) of Brazil, but under parts paler and more whitish, middle of breast and belly pale grayish white (brownish gray in true *tataupa*); upper parts browner—less vinaceous or reddish brown, but not darker. Similar also to *C. t. peruviana* Cory of San Ramon, west central Peru, but much paler throughout, the under parts much more whitish and the upper parts much less vinaceous brown (*C. peruviana* is a darker bird than *C. tataupa*), and wing shorter.

¹ For change from *Leptodon* to *Chondrohierax* see Chubb, The Birds of British Guiana, Vol. I, p. 267, 1916.

Measurements.

<i>No.</i>	<i>Sex.</i>	<i>Locality.</i>	<i>Wing.</i>	<i>Tarsus.</i>	<i>Culmen.</i>
80123	♂ ad.	Perico	117.	32.5	21.5
80124	♂ ad.	Bellavista	118.	34.	22.
80125	♂ ad.	"	119.	35.	22.

Found only in the grassy uplands.

Rallidæ

Pardirallus rytirhynchus rytirhynchus (Vieill.). One adult ♂, Huancabamba, August 22.

The only specimen secured was taken near the Plaza of the little village of Sondor, a suburb or outlying town of Huancabamba. A number of rails, probably all referable to this species were observed in the meadows of an affluent of the Huancabamba River, but none of these could be secured. A little later a pair of rails were seen feeding with some of the village chickens in a slough near the plaza. One of these was singled out from the chickens and shot.

Charadriidæ.

Ptiloscelys resplendens (Tschudi). Three adults, one male, two females, Lake Warinja, August 18. At this point the plover was abundant, but was seen at none of the many other high lakes visited.

Scolapacidæ.

Actitis macularia (Linn.). One adult ♂, Huancabamba, August 27. Seen now and then along the stony bed of the Huancabamba River throughout the month of August.

Columbidæ.

Chloroenas œnops (Salvin). One adult ♀, Perico, September 11. Apparently rare in northwestern Peru, as only one or two small flocks were seen. These frequented the banks of a deep river valley, and were very shy.

***Zenaida auriculata pallens* subsp. nov.**

Four adults, both sexes, Sullana and Huancabamba, August.

Type from Huancabamba, northwestern Peru, adult ♂, No. 80019 M. C. Z. Collected August 22, 1916, by G. K. Noble.

Characters, similar to *Z. auriculata auriculata* (Des Murs) but upper parts slightly paler and grayer; under parts much paler, the vinaceous of neck and chest much lighter and more pinkish; lower breast, belly, sides and under tail coverts pale pinkish buff — almost whitish.

Measurements. Type adult ♂, wing, 148; tail, 98; tarsus, 23; exposed culmen, 19. Topotype adult ♀, No. 80022, wing, 143; tail, 95; tarsus, 20; exposed culmen, 16.

Remarks. This very pale form was a common bird along the streams that cross the coastal deserts. No specimen among the numbers we have examined from various parts of South America approach our birds in the general pallor of the under parts, and the form appears to be a well marked subspecies.

There is some probability that the type of *Zenaida hypoleuca* Bp. collected by Capt. Kellett and Lieut. Wood, now in the British Museum, did not really come from the Pearl Islands, but we hardly believe even so that it represents the local desert form we have just named.

Eupelia cruziana (Prev. & Knip.). Five adults, both sexes, Huancabamba, August.

A common bird in the cultivated lands about Huancabamba, but not observed elsewhere.

Leptotila decolor Salvin. Eight specimens, one immature ♀ and adults of both sexes, Bellavista and Huancabamba, August and September.

Frequently met with throughout the whole region traversed, except at the higher altitudes.

Psittacidæ.

Ara militaris militaris (Linn.). Four adults, both sexes, Bellavista, September.

Scattered flocks of these Aras passed each morning and evening up or down the Marañon. The birds chattered to each other as they flew. Their call was deep, and not unpleasant, very different from the raucous crys of most parrots. The flocks generally consisted of three or four individuals. Never more than seven birds were seen in a single flock.

Aratinga rubrolarvatus Massena et Sauancé. One immature ♀, Sullana, July 29. This skin has no red whatever on the head or the bend of the wing; the small under wing-coverts are however, mostly red. It resembles immature examples of *A. finschi* (Salv.), but is darker, less yellowish green, with the under surface of the wing darker, more olive, less yellowish, and has a much larger bill.

This Paroquet is very abundant along the river valleys which cross the coastal deserts. Flocks of several thousand individuals were often seen flying up the Chira River during the early evening.

Aratinga frontatus Cab. Seven adults, both sexes, Perico and Tabaconas, September.

A bird of the subtropical arid lands and the arid valleys of the Chinchipe and Marañon. It entirely replaces *A. rubrolarvatus* in the hills, and eastern river valleys where it is common in the thickets of acacias and cacti.

Psittacula caelestis caelestis (Less.). Fourteen specimens, immature and adults of both sexes, Huancabamba, August.

Although this species was found most abundantly at Huancabamba it was also observed in the humid subtropical region of Tabaconas, and the dry valley of the Marañon.

Pionus corallinus Bp. One adult ♂, Perico, September 14. This was the only individual seen, it was shot in the dense woods which fill the river valley at this point.

Cuculidæ.

Piaya cayana nigricrissa Scl. Eight adults, both sexes, Perico and Bellavista, September.

Abundant in the humid subtropical region as well as the dry tropical zone of the eastern Andean range. Several specimens were observed at Tabaconas.

Tapera nævia nævia (Linn.). One ♀, Perico, September 16.

Bubonidæ.

Otus roboratus sp. nov.

Two adult males, Perico and Bellavista, September.

Type from Bellavista, Peru, adult ♂, No. 80073 M. C. Z. Collected September 25, 1916, by G. K. Noble.

Characters. Unlike any south American form; in color somewhat similar to *O. cassini* (Ridg.) of Vera Cruz, Mexico, but considerably larger; toes perfectly naked; tarsus densely feathered.

Color. Both skins in brown phase. Pileum brownish black, the feathers with small lateral spots of paler brown; a broad whitish nuchal collar, the feathers of which are somewhat banded with dusky; ear-tufts mixed grayish white and warm brown; general color of upper parts grayish brown, somewhat barred or marked with dusky, and with some paler or browner irregular spots; outer webs of outer scapulars chiefly buffy white; outer webs of middle wing coverts also chiefly buffy white; alula notched and spotted with buffy white towards tips on outer webs and with cinnamon basally and on inner webs; primaries with large spots of buffy white on outer webs; inner webs dusky, with broad bands of cinnamon brown; tail grayish brown, with narrow bands of cinnamon brown, and freckled with dusky; face grayish white, browner on ear coverts, narrowly barred with dusky; under surface white, the feathers of breast, chest and sides with mesial streaks and narrow irregular cross bars of black, heaviest on chest and here bordered with warm brown; middle of belly clear white; legs buffy white, slightly vermiculated with brownish; under tail coverts white faintly vermiculated with dusky.

Measurements.

No.		Sex.	Wing.	Tail.	Tarsus	Culmen from Cere.
80073	Bellavista	♂	168.	82.	39.	14.
80072	Perico	♂	164.	87.	36.	14.

Remarks. Undoubtedly this is the Scops Owl, recorded by Salvadori and Festa (Boll. Mus. Zool. Torino. XV, p. 33, 1900) from Vines, western Ecuador, and referred by them with much doubt to *Scops guatemalæ* Sharpe.

Our specimens are easily told from *O. guatemalæ* or *O. vermiculatus* (Ridg.), but strangely enough are very like the more northern and very local *O. cassini* in color. Their much larger size will, however, at once distinguish them.

Pulsatrix perspicillata perspicillata (Lath.). One adult ♀, Perico, September 10.

This skin agrees almost exactly with specimens in the collection of T. E. Penard, from the vicinity of Paramaribo, Surinam. The toes are feathered almost to the claws, and it certainly belongs here and not to *P. melanonota* (Tschu.).

Glaucidium jardinii (Bp.). Three adults, one male, two females, Perico, September.

All of the Pygmy Owls secured were taken during the daytime in the thick but very dry patches of wood which border the Chinchipe at various points.

Speotyto cunicularia punensis Chapman. Five adults, both sexes, Sullana, August.

This strikingly pale form was lately described from Puna Island; our record slightly extends its range southward.

The five specimens were all collected at one colony. This colony of about two dozen burrows was situated on the gentle slope of a sandy hill which overlooked the green valley of the Chira River near Sullana.

Tytonidæ.

Tyto alba contempta (Hartert). Two adults, ♂ and ♀, Bellavista and Chongollapi, September and October.

Nyctibiidæ.

Nyctibius griseus cornutus (Vieill.). One adult ♀, Perico, September 10.

Caprimulgidæ.

Nyctidromus albicollis albicollis (Gml.). Five adults, both sexes, Perico, Bellavista, Tabaconas and Huancabamba, August and September.

These skins agree well enough with typical *albicollis* to be referred to that form. Mr. Cory has kindly compared them with his *N. albicollis obscurus* from Yurimaguas, Peru, and tells us that our bird has nothing to do with that dark colored subspecies.

Very abundant in all of the zones except the coastal desert. Several of the birds collected were induced to alight in open clearings by imitating their guttural whistle.

Alcedinidæ.

Chloroceryle americana cabanisi (Tschudi). Three adult females, Bellavista and Huancabamba, August and September.

Picidæ.

Hypoxanthus rivolii brevisrostris Tacx. One adult ♂, Tabaconas, September 11.

This species was seen on one or two occasions only, always in wooded valleys.

Chrysoptilus atricollis lymani Bangs & Noble. *Chrysoptilus atricollis lymani* Bangs and Noble, Proceedings of the New England Zoölogical Club, Vol. VI, p. 85-86, June 7, 1918, original description.

Six specimens, two immature (♂ and ♀) and adults of both sexes, Huancabamba, August.

Veniliornis callonotus major (Berl. & Stolz.). Two adult females, Sullana and Bellavista, July and September.

Veniliornis agilis (Cab. & Hein.). One adult ♂, Bellavista, September 29.

Ceophlæus lineatus lineatus (Linn.). Two adults, ♂ and ♀, Perico, September.

Scapanus melanoleucus (Gml.). One adult ♀, Perico, September 15.

Picumnus lafresnayeii Malh. One adult, (♀), Bellavista, September 24.

Trogonidæ.

Pharomachrus auriceps (Gould). One adult ♀, Tabaconas, August 19. This specimen is in no way smaller than Colombian skins, and we therefore do not refer it to *P. auriceps heliactin* (Cabs. and Hein.) which on geographical grounds it should represent.

Observed only in the humid subtropical forest of Tabaconas.

Trogonurus collaris (Vieill.). Three specimens, an immature ♀ and adult ♂ and ♀, Perico and Charapi, September.

Frequently noted in the subtropical forests between Tabaconas and the Chinchipe Valley.

Trochilidæ.

Thaumasius taczanowskii fractus subsp. nov.

Four adult males, Huancabamba, August.

Type from Huancabamba, northwestern Peru, adult ♂, No. 80118 M. C. Z. Collected August 9, 1916, by G. K. Noble.

Characters. Similar to true *T. taczanowskii* (Selater) but upper parts darker and purer green, less mixed with grayish and less coppery; bill much shorter.

Measurements.

No.	Sex.	Wing.	Tail.	Exposed culmen.
80115	♂ ad.	69.	38.	21.5
80116	♂ ad.	69.5	39.	22.
80117	♂ ad.	70.	40.5	21.5
80118	♂ ad.	68.	39.	22.

Remarks. We have made our comparison with skins of true *T. taczanowskii* collected by O. T. Baron at Malea Cajabamba, 8000 feet altitude, and Otusco, 4000 feet altitude, Peru, received in exchange, some years ago from the late Count Von Berlepsch. These agree almost exactly with the measurements and description of the type series.

By far the commonest hummingbird about Huancabamba was this species. It was observed very often in the shrubbery along the roadsides.

Patagona gigas peruviana Boucard. Three adults, two males and a female, Huancabamba, August.

Ocreatus cissurus cissurus Gould. One adult male, Perico, September 9.

Adelomyia melanogenys maculata Gould. One adult male, Tabaconas, September 2. This specimen appears to belong to this form rather than to *chlorospila* Gould of more southern Peru. Compared with skins from Ecuador, our one specimen is paler below and if others should prove to be the same, it represents a pale unnamed race.

Psalidoprymna gouldi chlorura (Gould). One adult male, Tabaconas, August 29.

Conopophagidæ.

Conopophaga peruviana Des Murs. One adult female, Perico, September 12. With but a single female we are not sure this identification is correct, possibly our bird is the female of *C. castaneiceps* Sel.

Formicariidæ.

Taraba melanura debilis Berl. & Stolz. Three specimens, an immature male and adult male and female, Bellavista, September.

Apparently our specimens belong to this form, described from Central Peru, agreeing much better in size and proportions with it than with true *T. melanura* (Gould) of Ecuador.

Thamnophilus radiatus variegaticeps Berl. & Stolz. One adult ♂, Bellavista, September 29. Our skin agrees fairly well with the description of this form from Central Peru.

Erionotus albiventris (Tacz.). Seven specimens, an immature male and adults of both sexes, Perico, September.

This is apparently a very distinct species; the male has a large white belly patch and a pale gray throat, in the female belly and throat both are whitish.

Dysithamnus semicinereus Selater. One male (not quite adult, still having a little yellow on lower belly), Perico, September 12.

In spite of Todd's recent review of the group of Ant Thrushes to which this bird belongs, there is still much doubt as to the number of forms that should be recognized. Chapman in his *Distribution of Bird Life in Colombia*, p. 370, says that the small race from the Pacific Coast of Ecuador and another from the western slope of the Central Andes in Colombia, are both good and as yet unnamed.

Our bird is not large, like Peruvian examples from the general region whence came the type of *D. tambillanus* Tacz. nor is it small as are west Ecuador skins, but affords the following measurements: wing, 66; tail, 41; tarsus, 20; culmen, 15, which are about those of Colombian specimens.

Hapalocercus meloryphus fulviceps (Sel.). One adult ♀, Perico, September 11.

Ridgway considers that *Hapalocercus* belongs in the Formicariidæ and we follow him in this disposition of the genus.

Grallaria albiloris Tacz. One adult female, Tabaconas, September 2.

The only representative of the genus observed throughout the entire trip was the specimen collected. It was found while scratching among the wet mosses of the forest floor near Tabaconas.

Furnariidæ.

Geositta peruviana paytæ Ménégaux and Hellmayr. Five adults, Paita, July.

These are topotypes. Whether or not this much paler bird should stand as a species, as the original describers considered it, or as a subspecies of *G. peruviana* Lafr., is of course a matter of opinion.

The Miner was the commonest bird about Paita. Flocks of them were

nearly always to be seen on the sandy hills surrounding the town, but the bird was not noted at all a few miles inland.

Furnarius cinnamomeus (Less.). Seven adults, both sexes, Huancabamba and Sullana, July and August.

The Oven-bird was often seen about the towns of Huancabamba and Sullana but in the sparsely inhabited interior it was not met with at all.

Synallaxis maranonica Tacz. Four adults, both sexes, Bellavista, September.

Synallaxis stictothorax Sel. Four adults, both sexes, Bellavista and Perico, September.

Siptornis cisandina (Tacz.)? Three specimens, two immature females and one adult male, Huancabamba, August.

We have compared our birds with a series of skins in the American Museum of *S. antisiensis* Sel. from which they differ in having the superciliary stripe grayish white (quits fulvous in *S. antisiensis*) and the ear coverts much grayer less fulvous or rusty. We have seen no specimens of *S. cisandina* and refer our birds to that form with some doubt. If they do represent it, it certainly is only subspecifically to be separated from *antisiensis*.

Phacellodomus rufifrons (Wied.). Sixteen specimens, both sexes, apparently all adult, Bellavista and Perico, September.

Dendrocolaptidæ.

Picolaptes warscewiczii (Cab. & Heine). Two adults, ♂ and ♀, Tabaconas, August 29 and September 1.

Cotingidæ.

Heliochera rufaxilla (Tschudi). One adult ♂, Tabaconas, September 3.

The single specimen collected was the only one observed. It was found singing on the top of a tall tree in the subtropical forests of the Tabaconas River Valley.

Cephalopterus ornatus Geoff. Two adults, male and female, from the woods northeast of Perico, September 16.

Pipridæ.

Pipra erythrocephala berlepschi Ridg. Three adult males, Perico, September.

Tyrannidæ.

Myiotheretes striaticollis (Sel.). One adult female, Huancabamba, August 22.

Serpophaga cinerea cana Bangs. Three adults, one male, two females, Huancabamba, August.

These specimens may be somewhat intermediate, but are nearer to *cana* than to the southern form, true *S. cinerea* (Strick.).

This little Flycatcher was seen only along the torrents of the central Andes. It runs nimbly over the rocks, and on several occasions was seen to pick up tidbits from the surface of the stream.

Tyranniscus uropygialis (Lawr.). One adult female, Tabaconas, September 1.

We have compared this skin with the type of Lawrence's *Mecocerculus uropygialis* kindly lent us for the purpose by the authorities of the American Museum of Natural History. The two specimens are very similar. Lawrence supposed his type came from Ecuador. It is a little larger than our bird, but if it is a male — ours is a female — sexual difference in size would just about account for the difference exhibited by the two specimens. The only other point of dissimilarity is that the back in the type is dull reddish olive whereas the back in our bird is olive. This difference is in all probability due to actual fading in the older specimen, such as so often occurs with olive in many species of birds.

The species is certainly not a *Mecocerculus*, but so far as we can see is a *Tyranniscus*.

The two skins afford the following measurements:

No.		Wing.	Tail.	Tarsus.	Exposed culmen.
42421 ¹	Type	62	49.	16.5	7.
79910 ²	♀	58	45.	16.5	7.

Camptostoma sclateri (Berl. & Tacz.) Three adults, one male, two females, Huancabamba, August and September.

Phæomyias murina tumbezana (Tacz.). Two adults, male and female, Perico and Bellavista, September.

Elania leucospodia Tacz. One adult female, Sullana, July 29.

Myiozetetes similis connivens Berl. & Stolz. Five adults, both sexes, Bellavista and Perico, September.

Our series bears out all characters claimed for the subspecies by its authors, and besides our birds average smaller with slightly smaller bills, than numerous examples from Bahia.

Mionectes striaticollis poliocephalus Tacz. One adult male, Tabaconas, September 1.

Leptopogon superciliaris poliocephalus Cab. & Heine. One adult female, Perico, September 12.

This specimen obviously belongs with the northern race, and is not different from birds from western Colombia.

Hellmayr, P. Z. S. 1911, p. 1132 has pointed out that the Central American bird must be referred to *poliocephalus* unless it represents still

¹ American Museum of Natural History.

² Museum of Comparative Zoölogy.

another race. In this connection we have carefully compared ten adults from Costa Rica with five from Colombia and can find no way in which they differ.

Our Perico female is not at all small, in all measurements being similar to females from Colombia and Costa Rica, and we believe the subspecies *transandinus* Berl. and Stolz. cannot be maintained. This was Hellmayr's opinion, also.

Pyrocephalus rubineus heterurus Berl. & Stolz. Eight specimens, one immature male and adults of both sexes, Paita, Sullana, Huancabamba, and Bellavista, July, August and September.

A very conspicuous and abundant bird in all of the lowlands.

Empidochanes pœcilurus peruanus Berl. & Stolz. Two adults, ♂ and ♀, Charapi and Perico, September.

Myiobius villosus Sel. One adult female, Perico, September 12.

Myiobius cinnamomeus cinnamomeus (d'Orb. & Lafr.). One adult female, Tabaconas, August 29.

Myiochanes fumigatus ardesiacus (Lafr.). Two adult males, Tabaconas, August 29 and September 2.

Myiochanes punensis (Lawr.). Three adults, two males and a female, Huancabamba, August.

Myiophobus fasciatus saturatus Berl. & Stolz. Three specimens, one immature female, and adult male and female, Huancabamba, August.

Sayornis nigricans angustirostris Berl. & Stolz. One adult male, Perico, September 13.

Our skin agrees in all color characters with Berlepsch and Stolzmann's description of the central Peruvian form. Its bill, however, is not smaller than is usual in examples of *S. n. cineracea* (Lafr.) from Venezuela and eastern Colombia. Berlepsch and Stolzmann in one of their papers (Ornis, Vol. XIII, p. 85) speak of a specimen with a larger bill than the type, and in another article refer a bird with a small bill from Ecuador to this form. The size of the bill would therefore seem to be somewhat variable, and we have little hesitation in allotting our specimen to this subspecies.

Myiarchus tyrannulus chlorepsciscus Berl. & Leverkühn. Two adult males, Bellavista, September.

Myiarchus ferox phæocephalus Sel. Four adults, both sexes, Bellavista and Perico, September.

Myiarchus cephalotes Tacz. Two adults, male and female, Tabaconas, September.

Myiarchus atriceps Cab. Two adults, male and female, Tabaconas, September.

Myiarchus semirufus Sel. One adult female, Sullana, July 30.

Tyrannus melancholicus melancholicus Vieill. Six adults, both sexes, Tabaconas, Huancabamba, and Bellavista, August and September.

It was a rare exception to find a bird in several life zones. Nevertheless

this species was observed everywhere but in the high mountains and along the coastal deserts.

Mimidæ.

Mimus longicaudatus punensis Hellmayr. Four adults, both sexes, Sullana, July.

Although the Mockingbird was perhaps the most characteristic bird of the coastal deserts it was not seen at all in any of the deserts of the interior. At Sullana it was observed to feed on lizards (*Tropidurus*).

Turdidæ.

Turdus reevei Lawr. Three adults, one male, two females, Huancabamba, August.

Turdus maculirostris Berl.? One immature female, Huancabamba, August 17.

Apparently our bird belongs here, having but one immature specimen makes our identification not positive.

Turdus gigas gigantodes Cab. Two specimens, male and female, both immature, Huancabamba, August.

A very common species in all the highlands.

Turdus chiguanco conradi Salv. & Festa. Seven specimens, one immature ♂, and adults of both sexes, Huancabamba, August.

The most abundant thrush in the central Andes of northern Peru.

Turdus maranonicus Tacz. Seven adults, both sexes, Tabaconas, Perico, Bellavista, Charapi and Huancabamba, August and September.

Unlike the two above mentioned species this thrush was found only in the trees or bushes. It was never seen in the open, feeding on the ground, like the other species.

Poliptilidæ.

Poliptila anteocularis maior Hellm. Two adult males, Huancabamba, August.

Poliptila bilineata bilineata (Bp.). Two specimens, male and female adult, Sullana, July 29.

These clearly are referable to the typical form and not to *P. b. andina* Hellmayr of the Cajabamba region of northern Peru.

Troglodytidæ.

Heleodytes balteatus (Baird). Two adults, male and female, Sullana, July.

The Cactus Wrens were perhaps the noisiest of the small birds found about Sullana. They were always fighting and their scolding note is very unpleasant. This cry is a raucous, gurgling sound emitted at short inter-

vals and with great force. The sound is very rhythmic and often so prolonged that it becomes exceedingly monotonous.

Heleodytes fasciatus (Swainson). Five specimens, one immature male and adults of both sexes, Huancabamba, August.

The young bird differs from the adult in having the whole crown uniform dark brown, and in having a conspicuous superciliary stripe.

This form in spite of its decidedly darker coloration is possibly only subspecifically distinct from the former. The ranges of the two species are adjacent and apparently do not overlap. The light colored form occurs only in the coastal desert, and is replaced by the dark one at the foothills of the Andes. Both species,—or geographical races—were found abundantly, and their harsh scolding note was often heard, but never in the region east of Tabaconas.

Phlegopedius sclateri (Tacz.). Two adults, male and female, Bellavista, September.

Troglodytes musculus albicans Berl. & Tacz. Four specimens, three adult males and an adult female, Huancabamba and Bellavista, August and September.

We have no hesitation in referring the three males taken at Huancabamba to this west Ecuador form, which they very closely resemble. The one adult female from Bellavista is however, slightly larger and darker in color, and though in somewhat well worn plumage, the obsolete dark barring of the back is more evident. It is, we consider, an intermediate approaching *T. musculus tectellatus* (Lafr. and d'Orb.).

Corvidæ.

Cyanocorax mystacalis (Geoffr.). One adult female, Sullana, August 1.

On the western range of the Andes and even along the coast this Jay is fairly abundant, but it is replaced on the other ranges and in the interior by the following species.

Xanthoura yncas yncas (Bodd.). Seven specimens, one immature male and adults of both sexes, Tabaconas, August and September.

An adult male No. 79885 has a queer asymmetrical tail, which made him very conspicuous in life, as he hopped about in the scrub, occasionally spreading it. The three outer rectrices, normally yellow, on the left hand side are pinkish salmon color (varying on the different feathers or parts of the feathers from Orange Pink and Light Salmon Orange to Salmon Color, of Ridgway). A few of the under tail coverts and some feathers on the flank on the left side, are also of this pink color.

Vireonidæ.

Vireosylva chivi griseibarbatus Berl. & Tacz. Four adults, both sexes, Bellavista and Perico, September.

Vireosylva josephæ josephæ (Sel.). Two adult males, Tabaconas, August.

Cyclarhis virenticeps Sel. One adult female, Tabaconas, September 4.

This bird was shot in a heavily wooded region, strongly Ecuadorean in its fauna (especially shown by the reptiles and amphibians), one of the very few really forested areas through which the expedition passed.

Cyclarhis coutrerasi Tacz. Three specimens, one immature and two adult females, Perico and Huancabamba, August and September.

All three were taken in open, sandy country.

The immature bird has the crown mixed ferruginous and green and gray, a ferruginous band surrounding the occiput and passing through the eye on each side to the front, which is also ferruginous.

Both adults are extreme of this form; the bird from Tabaconas is an extreme of *C. virenticeps* and we are therefore forced to regard these two forms as distinct species.

Hirundinidæ.

Stelgidopteryx ruficollis uropygialis (Lawr.). One adult male, Bellavista, September 24.

Pygochelidon cyanoleuca (Vieill.). Six specimens, three immature, three adult, both sexes, Huancabamba, Perico and Charapi, August and September.

The adults have completed or nearly completed the postnuptial moult, and are greenish steel blue above. In examining a large series from Costa Rica we find autumnal specimens constantly more greenish, steel blue less violaceous than spring killed examples. Peruvian birds agree exactly, so far as we can see, with the Costa Rican ones. On the other hand all skins from eastern Brazil to the Santa Marta region of Colombia, regardless of seasonal differences, are much more truly violaceous above, and while the difference is slight it appears to be constant and it may still be found expedient to use the name *P. cyanoleuca montana* (Baird) for the northern and western form.

Mniotiltidæ.

Myioborus verticalis verticalis (d'Orb. & Lafr.). Six adults, both sexes, Tabaconas and Huancabamba, August.

Cœrebidæ.

Diglossopsis cærulescens pallida Berl. & Stolzm. One adult (sex not determined), Tabaconas, September 3.

This example is wholly referable to the southern form, agreeing perfectly with a skin collected by O. T. Baron at Leimabumba, which had been determined by the late Count Von Berlepsch.

Dacnis cayana glaucogularis Berl. & Stolz. One adult male, Perico, September 12.

Cœreba magnirostris (Tacz.). Six adult males, Huancabamba, Perico and Bellavista, August and September.

This is a very distinct form, its enormous bill (exposed culmen 16-18 mm.), grayish back and large white speculum at once separating it. Berlepsch and Stolzmann P. Z. S., March 3, 1896, p. 337, have suggested that perhaps *C. peruviana* (Cab.) is an earlier name for the species. After carefully reading Cabanis's original description we can see no way of ever being certain what his bird, based, he himself says, on an imperfect specimen, really was, and prefer for the present, anyway, to use Taczanowski's appropriate name.

Icteridæ.

Ostinops alfredi alfredi (Des Murs). Ten adults, both sexes, Perico and Bellavista, September.

Molothrus bonariensis occidentalis Berl. & Stolz. Seven adults, both sexes, Sullana, July and August.

Only seen on the coastal deserts where it occurs in large flocks.

Icterus mesomelas taczanowskii Ridg. Three adult males, Perico and Bellavista, September.

Some of the natives at Sullana kept this Oriole as a cage bird. It is probable that they captured the bird in the immediate vicinity, although the expedition did not meet with it there.

Trupialis bellicosa (De Filippi). Eight adult males, Huancabamba, August.

Inhabits the grassy interandean valleys, never observed in the lowlands.

Tanagridæ.

Tanagra taczanowskii (Sel.). Nine adults, both sexes, Perico and Bellavista, September.

Tanagra xanthogaster quitensis Nelson. One adult male, woods west of Perico, September 11.

Compsocoma sumptuosa sumptuosa (Lesson). Two adults, male and female, Charapi, September 6.

Tangara chilensis (Vig.). Four adult males, Charapi, September.

Tangara pulchra pulchra (Tsch.). One adult male, Charapi, September 12.

Tangara gyroloides catharinæ Hellmayr. Two adults, male and female, Charapi, September 11.

Tangara parzudakii florentes subsp. nov.

One adult female, Charapi, September 6.

Type from Charapi, northwestern Peru, adult ♀, No. 79675, M. C. Z. Collected, September 6, 1916, by G. K. Noble.

Characters. Similar to true *T. parzudakii* (Lafr.) of Bogotá, but larger, and belly and under tail coverts much paler,—the belly Warm Buff, the under tail coverts pale Ochraceous Tawny. Wing, 87; tail, 57; tarsus, 20.5; exposed culmen, 10 mm.

Remarks. We have compared our bird with the two *cotypes* of the species and with "Bogotá" skins, and believe, in spite of having but a single specimen, that it represents a well marked race. In "Bogotá" skins, the wing runs from 78 to 81 mm.

Tangara cyaneicollis cæruleocephala (Swains.). Two adults, male and female, Perico and Tabaconas, September.

Tangara venusta (Selater). Three adults, two males and a female, Charapi, September.

Tangara argentea fulvigula Berl. and Stolz. Four adults, three males and a female, Tabaconas and Huancabamba, August and September.

Thraupis cœlestis major (Berl. and Stolz.). Six specimens, one immature female and adults of both sexes, Huancabamba and Tabaconas, August and September.

Thraupis cana quaesita subsp. nov.

Three adults, two males and a female, Sullana, July.

Type from Sullana, northwestern Peru, adult ♂, No. 79692, M. C. Z. Collected, July 30, 1916, by G. K. Noble.

Characters. Very similar to true *T. cana* (Swainson) of Venezuela and northern Colombia, but darker in general coloration, grayish blue of under parts darker and bluer; back slightly darker; lesser and middle wing coverts much darker blue—Dark Diva Blue (Campanula Blue in true *T. cana*).

Measurements.

No.	Sex.	Wing.	Tail.	Tarsus.	Exposed culmen.
79692	♂ ad.	90.	66.	22.	7.5
79693	♂ ad.	88.	67.	20.	8.
79694	♀ ad.	87.	65.	19.	7.5

Remarks. Our three skins agree exactly among themselves, and cannot be matched in a very large series of true *T. cana*. The darker and different blue of the wing coverts is the chief character of the new subspecies which occupies the extreme southwestern corner of the range of the species.

The range of this subspecies apparently does not overlap that of *Thraupis cœlestes major*. This subspecies was found only in the coastal desert and never in the interior as the latter species.

Thraupis darwini læta Berl. and Stolz. Twenty-one specimens, immature and adults of both sexes, Huancabamba, August.

Sporothraupis cyanocephala cyanocephala (d'Orb. and Lafr.). One adult male, Tabaconas, September 2.

Piranga testacea tschudii Berl. and Stolz. Eight specimens, one immature male, three adult (red) males and four females, Tabaconas and Huancabamba, August and September.

On comparing these skins with the large series, including all the forms of *testacea* (except *Piranga hæmalea* Salv. and Godman of Mt. Roraima which Berlepsch considers specifically distinct) in the Museum of Comparative Zoölogy, it was at once apparent that the form occupying western Colombia needs a name. Of this bird we have nine specimens — six fully adult red males and three females, all collected by Mervyn G. Palmer, and received some few years ago from W. F. H. Rosenberg of London. They come from La Maria, Dagua Valley and San Antonio, Rio Cali. This form is nearer to true *P. testacea* Sel. and Salv. Nicaragua to Veragua and Chiriqui, than to any of the others, and has been referred to true *testacea* by Chapman in his 'Distribution of Bird-Life in Colombia,' we however, cannot agree to this and propose to call it

Piranga testacea desidiosa subsp. nov.

Type from La Maria, Dagua Valley, west Colombia, No. 23477 Bangs Coll. in M. C. Z., adult ♂. Collected May 23, 1908, by M. G. Palmer.

Characters. Adult ♂, similar to same sex in *P. testacea testacea* Sel. & Salv. but more intense and brilliant red, lacking the dull brownish-red chest of true *testacea*; underparts scarlet red slightly paler and more scarlet on belly and but little shaded on sides and not at all on chest with brownish red; upper parts slightly richer brownish-red. Adult ♀ similar to same sex in *P. t. testacea* but yellower, less greenish below.

Hemithraupis guira guira (Linn.). One adult female, Perico, September 11.

Thlypopsis inornata (Tacz.). Six adults, both sexes, Tabaconas, Bellavista and Perico, September.

Ramphocelus carbo connectens Berl. and Stolz. Nine adults, both sexes, Perico and Bellavista, September.

Tachyphonus rufus (Bodd.). Five adults, both sexes, Perico and Bellavista, September.

Fringillidæ.

Spinus ictericus peruanus Berl. Stolz. and Stolz.

Five specimens, one immature male and adults of both sexes, Bellavista and Huancabamba, August and September. Our specimens are not quite typical of true *S. i. peruanus* of Central Peru, though probably nearer that form than any of the others. Compared with one or two specimens of *peruanus* they are brighter yellow below with brighter yellow rumps, thus closely approaching *S. i. alleni* Ridg. of Matto Grosso, but our birds have grayish not olive-yellow edges of tertials. They differ at once from

S. i. capitalis (Cab.) in being smaller and in having yellow not white femoral region. On the whole we feel content to call them, for the present, *peruanus* somewhat approaching *alleni*.

Astragalinus psaltria croceus (Jouy). Four adults, one male, three females, Bellavista, September.

The male and one of the females are extreme of this form, with the maximum amount of white in the tail; the male with the characteristic light yellow underparts. Of the two remaining females, one has very little white, this whitish not pure white, in the tail; the other none. We cannot however, bring ourselves to refer these two to another form — *A. p. columbianus* (Lafr.).

This was written before the appearance of Chapman's 'Distribution of Bird-Life in Colombia' and we refer to his remarks, p. 564, where the equally puzzling examples from Colombia are discussed at length.

Myiospiza aurifrons (Spix). Three adults, one male, two females, Bellavista, September.

Brachyspiza capensis peruviana (Less.). Eight adults, both sexes, Huancabamba, August.

Phrygilus alaudinus (Kittl.). One adult female, Huancabamba, September 3.

Phrygilus ocularis ScL. Six specimens, two immature males and adults of both sexes. Huancabamba and Sullana, August.

Coryphospingus cucullatus (Müll.). Two adult males, Bellavista and Perico, September.

Sicalis flaveola (Linn.). Three adult males, Huancabamba, Sullana, and Bellavista, August and September.

Volatinia jacarini splendens (Vieill.). Four specimens, one immature male, and three adult males, Bellavista, September.

These do not appear to differ from Central American examples. One adult male has the under wing coverts and axillars wholly black; the others have some slight admixture of white, but only to the same extent often shown by specimens from the very northern part of the range of the subspecies.

Piezorhina cinerea Lafr. Two adults, male and female, Sullana, July.

Sporophila simplex (Tacz.). One adult male, Bellavista, September 25.

Sporophila gutturalis inconspicua Berl. and Stolz. One female, Bellavista, September 25.

It is doubtful if the subspecies can with certainty, be told by a single female, and we refer our bird to *inconspicua*, only because the chances seem to favor its being that form.

Catamenia homochroa ScL. Two immature males, Tabaconas, September.

Pheucticus chrysogaster (Less.). Six adults, both sexes, Huancabamba, August.

Saltator striatipectus peruvianus Cory. Six adults, both sexes, Huancabamba, August.

Cory's seven specimens, upon which he based this subspecies were from Hda. Limon, 10 miles west of Balsas, northern Peru, and agree almost perfectly with ours. Possibly ours are not quite so dark.

NOTES ON NORTH AMERICAN BIRDS.

VI.

BY HARRY C. OBERHOLSER.

THE present paper continues the writer's notes on North American birds.¹ In the following pages there are discussed six species and subspecies, belonging to the families *Alcedinidæ*, *Tytonidæ*, *Certhiidæ*, *Paridæ*, *Mniotiltidæ*, and *Fringillidæ*.

Streptoceryle alcyon caurina (Grinnell).

The western form of *Streptoceryle alcyon* was originally described by Dr. Joseph Grinnell,² from a specimen taken on Montague Island, Prince William Sound, Alaska. Its geographic distribution has been considered to extend in western North America from Alaska to western Mexico. Recently, however, its validity as a race has been questioned,³ because of the occurrence in British Columbia of specimens similar to eastern birds. A good series of eastern examples, however, compared with Pacific Coast birds, shows that *Streptoceryle alcyon caurina* is a readily recognizable race. That specimens occur difficult to distinguish does not of course invalidate a subspecies which is based, and properly so, on

¹ For previous papers in this series, cf. 'The Auk,' XXXIV, April, 1917, pp. 191-196; XXXIV, July, 1917, pp. 321-329; XXXIV, October, 1917, pp. 465-470; XXXV, January, 1918, pp. 62-65; and XXXV, April, 1918, pp. 185-187.

² Univ. Calif. Publ. Zool., V, No. 12, March 5, 1910, p. 388, fig. 4.

³ Taverner, Summary Rep. Geol. Surv. Dept. Mines Canada, for 1916 (1917), p. 361.

average characters. It seems worth while also to call attention to the point that the larger general size of *Streptoceryle alcyon caurina* is a better and more reliable character for the identification of specimens than the long wing tip, since the latter is liable to be affected by the makeup of the skin.

Tyto pratincola (Bonaparte).

Mr. Ridgway has recently ¹ placed the American Barn Owl (*Tyto pratincola*) as a subspecies of the South American *Tyto perlata*. Comparison, however, of a series of specimens of *Tyto pratincola* with examples of the European *Tyto alba alba* and *Tyto alba guttata* indicates that the North American bird is only subspecifically related to the races of Europe. It differs from *Tyto alba alba* in its larger size, darker coloration above, and usually more ochraceous suffusion below. The difference in coloration, however, is not strongly marked, and is at once seen to be but average; and *Tyto pratincola* is in this respect even more like *Tyto alba guttata* of middle Europe than like *Tyto alba alba* of the Mediterranean region. The larger size of the American bird is really the only striking character which separates it from the European forms; but even this, on comparison with a sufficient number of specimens, proves to be bridged over by individual variation. In fact, many specimens of South American races which certainly but subspecifically differ from *Tyto pratincola* are of practically the same size as European birds. There seems, therefore, no alternative but to consider the American Barn Owl a subspecies of the typical European bird, and its name will therefore become *Tyto alba pratincola*.

Certhia familiaris americana Bonaparte.

In a comparatively recent publication,² Dr. C. E. Hellmayr has treated *Certhia familiaris americana* and all the other American forms of this genus as subspecies of *Certhia brachydactyla* Brehm.

¹ Bull. U. S. Nat. Mus., No. 50, part VI, 1914, pp. 601, 602, 605.

² Wytsman's Genera Avium, XV, 1911, p. 8.

This latter species differs from *Certhia familiaris* Linnæus principally in its shorter, more curved hind claw and its longer bill. The color differences assigned by Dr. Hellmayr for these two species do not always correlate with the structural characters. There seems to be some mistake in this allocation of the American forms, since *Certhia familiaris americana* is very closely allied to *Certhia familiaris familiaris* of Europe, and, judging by the shape and size of its hind claw and bill, certainly conspecific. All the American forms are well known to be certainly but subspecifically different from *Certhia familiaris americana*, and, therefore, all should be regarded, as they formerly have been, subspecies of *Certhia familiaris familiaris*.

***Penthestes carolinensis* (Audubon).**

In a revision of the Paridæ, published a few years ago,¹ Dr. C. E. Hellmayr relegated *Penthestes carolinensis* (Audubon) to subspecific rank under *Penthestes atricapillus* (Linnæus). A close study of these birds in life and in the cabinet indicates that this view of their relationship does not best represent the facts; for, while the characters of plumage and of size separating them are relatively slight, these are likewise relatively constant, and it is possible to identify all normal specimens. Their songs, or rather love notes, are radically different in quality and form and can never be mistaken. Furthermore, wherever their breeding ranges meet or overlap, as they do in places in the eastern United States, particularly in the southern Allegheny Mountains, both birds remain just as distinct in all respects as elsewhere. Hence they should evidently be considered distinct species.

***Dendroica coronata hooveri* McGregor.**

This race of the Myrtle Warbler was originally described by Mr. R. C. McGregor² from a specimen taken at Palo Alto, California. Most subsequent authors, however, with the exception of Dr.

¹ Wytsman's *Genera Avium*, XVIII, 1911, p. 34.

² Bull. Cooper Orn. Club, I, No. 2, March, 1899, p. 32.

Joseph Grinnell and a few western ornithologists, have refused it recognition, and Mr. J. H. Riley has recently¹ expressed serious doubts regarding its validity. Its failure of recognition has probably been due chiefly to the statement of the original describer, that it differs from *Dendroica coronata coronata* only in somewhat greater size. Examination of a large series now shows that *Dendroica coronata hooveri* is a recognizable race and that it differs from *Dendroica coronata coronata* not only in its larger size but in the coloration of male, female, and even young. The male has less black on the lower parts, that on the jugulum and on the sides of the breast being more broken by white; and the yellow of rump averages paler. The female has the upper parts more grayish (less rufescent brownish) and also the yellow of the rump usually somewhat lighter. Juvenal birds are usually darker, duller, less rufescent brown above than examples of *Dendroica coronata coronata* in the same stage.

The geographic distribution of *Dendroica coronata hooveri* is as follows: Western North America. Breeds north to northwestern Mackenzie, northern Yukon, and north central Alaska; west to western Alaska; south to southern Alaska, central British Columbia, and central Alberta; and east to eastern Alberta and central Mackenzie. Winters north at least to California, New Mexico, and Texas; south to the state of Vera Cruz in Mexico, and southern Lower California.

***Acanthis hornemanni exilipes* (Coues).**

Redpolls are among the most difficult of American Fringillidæ. The relationships of the forms of the genus *Acanthis* were for many years imperfectly understood. Recently, also, the subspecific assignment of *Acanthis hornemanni exilipes* has been questioned,² but on the basis of winter specimens, which are always more or less unsatisfactory for the delimitation of geographic races. It is claimed by this author³ that *Acanthis hornemanni exilipes* is a

¹ Canadian Alpine Journal, Special Number, 1912 [February 17, 1913], pp. 70-71.

² Brooks, 'The Auk,' XXXIV, No. 4, January, 1917, p. 44.

³ Brooks, loc. cit.

subspecies of *Acanthis linaria*, because it intergrades perfectly with that species, but not with *Acanthis hornemanni*. While of course in some plumages certain specimens are difficult to distinguish, the same is true of many another distinct species. Present comparisons, based on specimens in breeding plumage, show that *Acanthis hornemanni exilipes* and *Acanthis linaria linaria* are usually separable by the white rump and the slight streaks on the under tail-coverts of the former, which are the characters that ally *Acanthis hornemanni exilipes* to *Acanthis hornemanni hornemanni*; in fact, in ordinary condition *Acanthis hornemanni exilipes* is a miniature of *Acanthis hornemanni hornemanni*, though it averages somewhat darker. A further and serious obstacle to considering *Acanthis hornemanni exilipes* a subspecies of *Acanthis linaria linaria* is that both breed on the same ground over a wide geographic area extending from Ungava to southern Keewatin and Alaska, and that they retain their distinctive characters everywhere, although apparently sometimes hybridizing. It is evident, therefore, that whatever the relationship of *Acanthis hornemanni exilipes* to *Acanthis hornemanni hornemanni*, the former cannot by any means be a subspecies of *Acanthis linaria*.

THE SUBSPECIES OF *LARUS HYPERBOREUS* GUNNERUS.

BY HARRY C. OBERHOLSER.

No subspecies of *Larus hyperboreus* have hitherto been formally recognized. Recent investigation, however, has shown that the bird of Alaska, described by Mr. Ridgway as *Larus barrovianus*, is a readily separable race. Its relationships with *Larus hyperboreus hyperboreus* are set forth below.

For the purpose of the present study the writer has been privileged to examine 240 specimens, including the type of *Larus barrovianus*, which number represents the entire material of this

species in the collections of the following institutions and individuals: the United States National Museum, including the Biological Survey; the Academy of Natural Sciences of Philadelphia; the American Museum of Natural History; the Museum of Comparative Zoölogy; and the Brooklyn Museum of Arts and Sciences; Mr. John E. Thayer, Mr. William Brewster, Mr. A. C. Bent, Dr. J. Dwight, Dr. L. B. Bishop, and Dr. L. C. Sanford.

***Larus hyperboreus hyperboreus* Gunnerus.**

[*Larus*] *glaucus* BRÜNNICH, Ornith. Bor., 1764, p. 44 (Iceland) (nec *Larus glaucus* Pontoppidan, 1763, qui *Larus canus* Linnæus).

Larus hyperboreus GUNNERUS, in Leem's Beskr. Finm. Lapper, 1767, p. 226, footnote (northern Norway).

Larus giganteus BENICKE, Ann. Wetterau. Gesellsch., III, 1812, p. 140 (Baltic Sea, northern Europe) (Temminck MS.).

Larus maximus O'REILLY, Greenland, the Adjacent Seas, etc., 1818, p. 141, pl. XIII (Greenland Seas) (nec *Larus maximus* Forster, 1817, qui *Larus marinus* Linnæus) (Bullock MS.).

Larus leucereetes SCHLEEF, Ann. Wetterau. Gesellsch., IV, Heft II, 1819, p. 314 (in text) (far north [of Europe]; accidental on coast of Germany) (Meyer MS.).

Larus consul BOIE, (Wiedemann's) Zool. Mag., I, pt. III, 1819, p. 126 (near Helsingör, Denmark).

Larus medius BREHM, Beitr. Vogelk., III, 1822, p. 810 (Seeland I., Denmark).

Larus islandicus EDMONSTON, Mem. Wern. Soc., IV, 1822, p. 185.

Larus minor BREHM, Handb. Naturg. Vög. Deutschl., 1831, p. 736 (nom. nov. pro *Larus medius* Brehm).

Larus glacialis BREHM, Lehrb. Naturg. Europ. Vögel, II, 1824, p. 704 (extreme northern colony of Greenland) (Benicke MS.).

Larus Hutchinsii RICHARDSON, Fauna Bor.-Amer., II, 1831 (1832), p. 419 (Albany River, Ontario).

CHARS. SUBSP.—Size large; mantle pale.

MEASUREMENTS.¹—Male: wing, 457–483 (average, 468) mm.; tail, 190–213 (198); exposed culmen, 60–69 (63.8); height of bill at base, 21–26 (23); tarsus, 70–75 (72); middle toe with claw, 69–74 (71).

Female: wing, 432–451 (average, 441) mm.; tail, 184–206 (191); exposed culmen, 56–61 (57.9); height of bill at base, 19–22 (20.2); tarsus, 66–73 (69); middle toe with claw, 63–72 (67).

¹ From Dwight, 'The Auk,' XXIII, No. 1, January, 1906, p. 28, except for dimensions of bill, which have been remeasured for the present use.

TYPE LOCALITY.—Northern Norway.

GEOGRAPHIC DISTRIBUTION.—Europe, Asia, eastern and middle North America. Breeds north to Wrangell Island in northeastern Siberia, New Siberia Islands north of Siberia, Crown Prince Rudolph Island in Franz Josef Land, Spitzbergen, northern Greenland, Grant Land, and Prince Patrick Island in Franklin Territory; west to Prince Patrick Island, Melville Island, and Coronation Gulf in Mackenzie; south to Coronation Gulf, Cape Fullerton in Keewatin, Great Whale River in central western Quebec (Ungava), Newfoundland, Hopedale in eastern Labrador, southern Greenland, Iceland, northern Norway, and the coast region of northeastern Europe and northern Siberia; and east to the Pribilof Islands, Alaska, and the Diomed Islands, northeastern Siberia. Winters north to the coast region of northern Siberia, the coast of northern Europe, Iceland, southern Greenland, and Baffin Land; and south to Japan, the northern part of the Caspian Sea, Akaba on the northern part of the Red Sea, Gibraltar, England, Ireland, North Carolina, northern Pennsylvania, northwestern Indiana, and casually to northern Texas.

Remarks.—In this, the typical form of the species, the mantle is very constantly pale, but size as a differential character is more variable. Birds from Davis Strait and Cumberland Sound, west of Greenland, seem to be as large and pale as Old World examples. All of the birds examined from eastern Siberia and Japan belong also to this race. A single adult from Walrus Island in the Pribilof group, taken, June 13, 1890, and now in the United States National Museum, is very large and pale; in fact, is of maximum size, and in color fully as light as the palest specimens of the present race; and, since the species is known to breed on this island, probably represents the resident form. A single specimen from Akaba on the northeastern arm of the Red Sea is the southernmost record for any form of *Larus hyperboreus*.

The well-known wholly white plumage phase of this gull, which was described by Richardson as *Larus hutchinsii*,¹ seems to be, as indicated by Dr. J. Dwight,² a subadult plumage of the second year, although it is possible that not all individuals pass through this condition. As explained under *Larus hyperboreus barrovianus*, the specimen of Glaucous Gull already recorded from northern Texas proves to belong to that race; but there is in the collection

¹ Fauna Bor.-Amer., II, 1831 (1832), p. 419 (Albany River, Ontario).

² 'The Auk,' XXIII, No. 1, January, 1906, p. 32.

of the Museum of Comparative Zoölogy at Cambridge, Massachusetts, where it is number 32371, an additional Texas specimen, taken by Mr. G. H. Ragsdale in northern Texas, presumably near Gainesville, but without exact date of capture, which is an example of *Larus hyperboreus hyperboreus*.

The name *Larus glaucus* Brünnich,¹ which has until recently been used for this species, is found to be preoccupied by *Larus glaucus* Pontoppidan,² which is a synonym of *Larus canus* Linnæus. The proper name for the species, therefore, becomes *Larus hyperboreus* Gunnerus,³ which, in point of date, is the next available name.

Of *Larus hyperboreus hyperboreus* 129 specimens have been examined, from the localities in the subjoined list:

Alaska.—Walrus Island, Bering Sea (June 13, 1890).

Franklin.—Brevoort Island, Ellesmere Land (May 21, 1900; June 10, 1901; Aug. 1, 1900; July 25, 1900 [nestling]); Rice Strait, Ellesmere Land (June 5 and 8, 1901); Cape Sabine, Ellesmere Land (Sept. 15, 1900); Buchanan Bay, Ellesmere Land (June 10 and 16, 1901); Alexander Haven, Ellesmere Land (July 25, 1900); Cumberland Sound (June 27, 1878; Sept. 6, 1878); Niantilik, Cumberland Sound (Aug. 8, 1876; Sept. 17, 1877); Observatory Island, head of Cumberland Sound (June 4 and 6, 1878); Davis Strait (Aug. 12 and 15, 1879); Cary Island, Baffin Bay (July 24, 1894); Simpson Bay, Victoria Land (July 26, 1911 [nestling]); Meteorite Island (Aug. 13, 1897 [nestling]).

Greenland.—Sukkertoppen (Sept. 1, 1904; Oct. 24, 1905; April 25, 1906; Dec. 3, 1909); Kahkoktah Cove (Sept. 1, 1893); Anniversary Lodge (Sept. 11, 1893); Bowdoin Bay (Sept. 9, 1893); McCormick Bay (Aug. 4, 1892 [nestling]); Robertson Bay (Aug. 23, 1892); Itiblu (July 22, 1892); Littleton Island (July 22 and 27, 1892); Cape York (July 26, 1892); Port Foulke; Holsteinborg (June 20, 1895; July 6, 1895; May 12, 1897; Sept. 21, 1898); Parker Snow Bay (Aug. 11, 1896); Julianehaab (April 6, 1908; May 4, 1909); Nyskotefjord (Aug. 17, 1900); Etah (July, 1910);

¹ Ornith. Bor., 1764, p. 44 (Iceland).

² Danske Atlas, I, 1763, p. 622.

³ In Leem's Beskr. Finn. Lapper, 1767, p. 226 (footnote).

Umanak (August, 1896); Hakluyt Island (July 19, 1901); North-umberland Island (July 11, 12, and 18, 1901).

Labrador.—Ramah (July, 1898); Lance au Loup (Dec. 1 and 17, 1899); Okak (July 19, 1896); Ailik (Nov., 1899); Nakvak (autumn, 1883).

Mackenzie.—Coronation Gulf (July 20, 1911 [nestling]; June 15, 1911).

New Brunswick.—Grand Manan I. (March, 1883; March 1, 1884; Feb. 10, 1898; Jan. 25, 1874).

Newfoundland.—Curselet (Dec. 31, 1894).

Nova Scotia.—Sable Island (Jan. 2, 1895; Feb. 12, 1895).

Quebec.—Tadousac (winter, 1901); Fort Chimo, Ungava (Dec. 18, 1882).

Maine.—Portland (Jan. 19, 1900; Mar. 4, 1891); Kittery Point, York County (Feb. 14, 1891); Ilsford (Dec. 20, 1886).

Massachusetts.—Charles River, Boston (April 4, 1881); Chatham (Feb. 13, 1917).

New York.—Washington County (January, 1860); Sag Harbor, Suffolk County (Dec. 11, 1890); Montauk, Long Island (Feb. 8, 1890).

Texas — [near Gainesville].

Great Britain.—Breakness, Orkney Islands (March 18, 1869).

Norway.—Bergen (Feb. 2, 1882).

Spitzbergen.—Isfjarden (June 16, 1900); Green Harbor (August, 1881).

Japan.—Otaru, Hokkaido Island (Feb. 20, 1899); Shiribeshi (November, 1906); Hakodate (March 25, 1887).

Siberia.—Kolyuchin Bay (July 9, 1909 [5 nestlings]); Cape Serdze (July 29, 1910); Novo Marinsk, at head of Gulf of Anadyr (1901); Diomedé Islands, Bering Strait (July, 1881); Gichiga (Sept. 21, 1900); Whalen Bay (July 20, 1910); Indian Point (August 9, 1910); Cape Bolshaja Baranow (July 6, 1912); Koliutschin Island (July 3 and 9, 1909 [nestlings]); northeastern Siberia (June 4 and 5, 1907); Semiavine Strait (= St. Lawrence Bay).

Turkey in Asia.—Akaba, Red Sea (April 18, 1914).

***Larus hyperboreus barrovianus* Ridgway.**

Larus barrovianus RIDGWAY, 'The Auk,' III, No. 3, July, 1886, p. 330 (Point Barrow, Alaska).

CHARS. SUBSP.—Similar to *Larus hyperboreus hyperboreus*, but smaller, the bill particularly so, and relatively as well as actually more slender; mantle decidedly darker; and the line of demarcation between the white tips to the primaries and the pale grayish basal portions usually more evident.

MEASUREMENTS.¹—Male: wing, 444–470 (average, 458) mm.; tail, 178–197 (189); exposed culmen, 56–65 (61.1); height of bill at base, 20–22 (20.9); tarsus, 69–74 (71); middle toe with claw, 66–72 (69).

Female: wing, 425–457 (average, 436) mm.; tail, 171–190 (180); exposed culmen, 46–60 (52.7); height of bill at base, 17–21 (18.7); tarsus, 62–73 (66); middle toe with claw, 58–71 (63).

TYPE LOCALITY.—Point Barrow, Alaska.

GEOGRAPHIC DISTRIBUTION.—Western North America. Breeds on the Arctic coast and islands north to Franklin Bay, northwestern Mackenzie, Hershel Island, Yukon, and Point Barrow, Alaska; west to the western coast of Alaska and to Unalaska Island; south to Unalaska Island, Amak Island, and the coast region of northern Yukon and northwestern Mackenzie; east to Amak Island, and the coast region of western Alaska and Franklin Bay in northwestern Mackenzie. Winters north to the Pribilof Islands and the Aleutian Islands; and south along the Pacific Coast to Monterey, California. Accidental in northern Texas.

Remarks.—Mr. Robert Ridgway first noticed the differences characterizing this race, and many years ago described it from a specimen taken at Point Barrow, Alaska, as a distinct species, under the name *Larus barrovianus*.² His emphasis on the relatively greater depth of the bill at the angle of the gonys, as compared with its depth at base, which now proves to be an inconstant character, was the evident reason for the rejection of the form by Dr. Dwight,³ and its relegation as a synonym to *Larus hyperboreus*. Although the relatively greater depth of the bill at the angle of the gonys proves to be valueless as a character to separate *Larus barrovianus*, this bird is very readily recognizable by its usually smaller size and particularly smaller bill, but especially

¹ From Dwight, 'The Auk,' XXIII, No. 1, January, 1906, p. 28, except for dimensions of bill, which have been remeasured for the present use.

² 'The Auk,' III, No. 3, July, 1886, p. 330.

³ 'The Auk,' XXIII, No. 1, January, 1906, pp. 27–29.

by its decidedly darker mantle. Although it really is but sub-specifically different from *Larus hyperboreus*, the restoration of this form of Mr. Ridgway's to standing among North American gulls is a pleasurable privilege.

This race appears to be confined in the breeding season to Alaska and the territories of Yukon and western Mackenzie. No Japanese specimens have been detected among those examined, but it is not at all unlikely that *Larus hyperboreus barrovianus* does occasionally migrate to Japan. The specimen of Glaucous Gull already recorded from the Red River in Clay County, Texas, proves to belong to the present race. The type of *Larus hyperboreus barrovianus* is No. 88913 of the United States National Museum register, and is still in the collection. It was taken on August 4, 1882, by Middleton Smith, at Point Barrow, Alaska. It agrees with other specimens of this subspecies in size, but is somewhat paler on the mantle than usual individuals, and is possibly not quite adult.

We have examined 111 specimens of the present race, from the following localities:

Alaska.—St. Michael (June 15, 1880; June, 1866; Sept. 21, 1877; Sept. 18, 1875; Sept. 1, 1876; July 15, 1866; July 15, 1915; Sept. 3, 8, and 13, 1899; June 28, 1915; Aug. 8 and 14, 1915); Point Barrow (Aug. 5 and 18, 1882; July 26, 1883; May 21, 1881; Sept. 9 and 15, 1882; June 1, 1882; Sept. 5, 17, 23, and 28, 1897; Aug. 11, 20, 24, 26, and 27, 1897; June 1, 2, 8, and 17, 1898; Oct. 5, 1897); Kowak River; St. Paul Island, Pribilof Islands (June 21, 1890); Bethel (July 14, 1914; Aug. 18, 1914; July 24, 1915); Unalaska, Unalaska I. (June 9, 1911; Nov. 1, 1903; Nov. 12, 1904); Beaver Inlet, Unalaska Island (July 4, 1901 [nestling]); near Bering Strait; Nome (Sept. 19 and 21, 1913; Sept. 2 and 11, 1910; July 28, 1902; Aug. 20, 1903; Aug. 10, 1902; Sept. 14, 1900; summer, 1901); Pikmiktalik River (July 1–15, 1877); Amak Island (July 18, 1911 [nestling]; Camden Bay (Aug. 4, 1913); Port Clarence (July 27, 1895; July 24, 1897); Yukon Delta (June 29, 1914); Wainwright Inlet (Aug. 17, 1914); Gwydyr Bay (July 16, 1910); Barter Island (Sept. 4, 1908); Kulugrua River (July 13, 1898 [nestling]); Demarcation Point (June 10, 1914); Griffin Point (July 12, 1914); Nelson Island (July 24, 1911); near Flaxman Islands, Arctic Ocean (July 31, 1913); Chamisso I. (Aug. 1, 1914).

British Columbia.—Comox (Nov. 9 and 15, 1903).

Mackenzie.—Langton Bay, arm of Franklin Bay (Sept. 12, 1910); Franklin Bay (June, 1905); Mackenzie River Delta (July 28, 1908; Sept. 8, 1909); mouth of Horton River, Franklin Bay (spring or summer, 1908).

Yukon.—Mouth of Firth River (Aug. 1, 1914 [nestling]).

California.—Monterey (Jan. 26, 1897; March 15, 1897); California (no further data given).

Texas.—Red River in Clay County (Dec. 17, 1880).

Washington.—Tacoma (May 2, 1914); Seattle Harbor (May 12, 1896).

GENERAL NOTES.

Cause of the "Fishy" Flavor of the Flesh of Wild Ducks.—Occasional specimens of wild ducks, apparently of any of the species, prove upon trial to have an unpleasant taste, which usually is called "fishy." The general conclusion in such cases is that the particular bird involved acquired its unusual flavor by feeding upon fishes. In other words fishiness is caused by eating fishes and everything that lives upon fishes is fishy.

To the writer it has long seemed that this theory, statement and conclusion are open to challenge. In the first place the majority of the species of wild ducks ordinarily eat very few fishes and secondly it is entirely improbable that an individual wild duck would depart so widely from the habitual feeding habits of its kind, and for so long a time, that as a result its flesh would be tainted.

Let us inquire into the matter of fish-eating causing fishiness. The importance of plentiful and cheap sources of protein has led to investigations of the value of fish as food for various animals, and among other points, that of the influence of this food upon the meat and other products has received attention. Investigations of the United States Department of Agriculture are summarized¹ as follows: "From the feeding experiments it appears that there has not been just cause for the assumption that the feeding of fish meal of good quality imparts a fishy taint to such products as milk, butter, eggs and meat. . . . if fed in reasonable amounts in conjunction with other foods."²

¹ Weber, F. C. Bull. 378, p. 20, 21, Aug. 22, 1916.

² This conclusion is corroborated in the following publications also. Live Stock Journ. (London), 77, 1913, No. 2039, pp. 463-4; Rev. Centro, Estud. Agron. y Vet., 7, 1914, No. 72, pp. 258-270; Bull. 610, U. S. Dept. Agr. Dec. 7, 1917, pp. 9.

What is the case with wild birds, even of those species that feed very largely upon fishes? William Brewster informs me that he has eaten young of both Loons and Red-breasted Mergansers and found them very good; the old birds he found tough and undesirable but not fishy. Dr. A. K. Fisher has tasted Mergansers of all three of our native species and reports that none of them tasted fishy. E. A. Preble agrees with this, but remembers that an adult Loon he tried was very bad and of a flavor he would call fishy. Vernon Bailey says that in his experience Mergansers have a rank but not fishy taste, and that the Hooded Merganser in fall is as delicious as any duck. Dr. Fisher has eaten both Hell-divers and Eared Grebes and found neither of them fishy. The writer's experience is the same; the latter has tested terns also and found them with a strong flavor like salted and smoked meat but not fishy. Mr. Preble has found young Gulls very palatable. Dr. Fisher gives the same finding for Razor-billed Auks and Murres. Bitterns are reported excellent by Messrs. Bailey and Brewster, the latter stating that one baked in a pit, was the most delicious bird he ever ate. The little Green Heron and Night Heron are favorably reported upon by Dr. Fisher. The Night Herons, or 'Gros-bees' as they are known in the region are a prized delicacy among the Louisiana Creoles. Mr. Brewster found Kingfishers very good.

Now all of the birds above mentioned feed more or less extensively upon fishes, the approximate proportion of their diet consisting of fish being indicated in the following list: Grebes 25%, Loons 80%, Razor-billed Auk and Murres 60%, Gulls 50%, Terns 75%, Hooded Merganser 25%, other Mergansers 90%, Bittern 15%, Little Green Heron 40%, Night Heron 40%, and Kingfisher 75%. It is thus perfectly evident that even habitual feeding upon fishes to a large proportion of the total subsistence, does not necessarily cause a fishy flavor in the flesh of the predator.

A fact that has a converse bearing upon the argument is that a definitely fishy flavor exists in various media with which fishes have no connection. For instance water in wells and even in large reservoirs and lakes sometimes has a pronounced fishy taste. Public opinion attributes this to the influence of fishes in these bodies of water; the real cause however, is the presence of certain algæ in great abundance.¹ The development of a fishy flavor has been observed in milk and butter and seems to be due to chemical or bacterial changes when these products have an abnormally high acidity.² These cases establish the fact that fishy flavor does not necessarily result from contamination from fishes.

From the facts adduced it appears that: (1) certain individual birds of species not habitual fish eaters have their flesh tainted by a flavor which popularly is called "fishy," but that, (2) habitual fish-eating birds do not necessarily taste fishy nor do the products of animals fed upon fish-meal,

¹ See Bull. 64, U. S. Bur. Plant Industry, 1904, 44 pp.

² See Circ. 146, U. S. Bur. Animal Industry, 1909, 20 pp., and Research Bull. 38, Iowa Agr. Exp. Sta. 1917, pp. 235-246.

as milk, butter, eggs and meat, and finally (3) a distinctly fishy flavor is evident in water, milk and butter under circumstances that preclude its being derived from fishes. I conclude therefore that the occasional so-called fishy bird probably does not taste thus because it has been feeding upon fishes. More probably the flavor of its flesh results from the physiological condition of the individual bird.¹ It may be due to by-products of the breaking down of fat, the reserve upon which such an individual has made great drafts, and the process may be similar to what takes place in fishy butter.—W. L. McATEE, *Washington, D. C.*

Cinnamon Teal (*Querquedula cyanoptera*) in North Dakota.—In the course of investigations of the wildfowl of North Dakota the writer was fortunate enough to find a pair of Cinnamon Teals (*Querquedula cyanoptera*) on June 15, 1918, in a slough adjoining Cherry Lake, Kidder County, in the south central part of the State. These birds were in the same pond with a number of Blue-winged Teals; were evidently mated; and were without much doubt breeding in the immediate vicinity. The locality is some three or four miles west of the northern end of Horsehead Lake, which is one of the largest lakes of the immediate region. So far as we are aware there is no other authentic summer record for the Cinnamon Teal in North Dakota.—HARRY C. OBERHOLSER, *Washington, D. C.*

White-winged Scoter (*Oidemia deglandi*) in South Carolina.—A mature male of his species was taken by me on January 31, 1918, on the eastern branch of Cooper River. The water was perfectly fresh and no unusual weather conditions existed. The specimen was alone, flying quite low and vigorously. No others have been seen by me either then or at any other time.—E. A. SIMONS, *Charleston, S. C.*

The Specific Name of the Glossy Ibis.—The Glossy Ibis is commonly known scientifically as *Plegadis autumnalis* (Linnæus) (*Tringa autumnalis* LINNÆUS, in Hasselquist, *Reise Paläst.*, 1762, p. 306. [Egypt]). Since, however, Hasselquist's *Reise Palästina* is merely a translation of the same book in Latin published prior to 1758, the scientific names it contains are undoubtedly untenable, according to the International Code of Nomenclature, as interpreted by Opinion 57 of the International Commission on Zoological Nomenclature. If this be satisfactory as a guide for our North American ornithological nomenclature, as we think it should be, we must change the name of the Glossy Ibis from *Plegadis autumnalis* (Linnæus) to *Plegadis falcinellus* (Linnæus) (*Tantalus falcinellus* LINNÆUS, *Syst. Nat.*, ed. 12, I, 1766, p. 241), as already shown by Mr. G. M. Mathews (*Birds of Australia*, III, pt. 5, 1914, pp. 396-397).—HARRY C. OBERHOLSER, *Washington, D. C.*

¹ It should be noted that animals in poor order often have a rank taste.

Nesting of the Bittern (*Botaurus lentiginosus*) in the Delaware Valley.—The Bittern is erroneously supposed to be a rare breeder in New Jersey, but recent researches by Mr. Richard C. Harlow along the maritime marshes have proven that it is a regular summer resident there; although it seems to be an extremely rare breeder anywhere in the Delaware Valley and particularly in the vicinity of Philadelphia.

On June 5, 1915, while exploring the marshes and swamps along a small creek at Woodbury, Gloucester County, N. J., in company with Turner McMullen, of Camden, N. J., we discovered a Bittern's nest; it was placed flat upon the muddy ground near the edge of a small patch of calamus and contained three nestlings and one rotten egg. The young birds were about a week old and the egg contained a dead chick. The nest was a mass of green and dead reed stalks, unattached to the tules and was fairly well hidden.

Woodbury is about eight miles from Philadelphia, to the south, situated upon Woodbury Creek and about a mile inland from the Delaware River. The nest was at the southern end of the town and is the first one ever found in the vicinity of Philadelphia, to my knowledge.—RICHARD F. MILLER, *Philadelphia, Pa.*

Yellow-crowned Night Heron at Chicago.—On Sunday, April 14, 1918, a friend and I were studying the birds in Jackson Park, Chicago, Ill. I was told that a specimen of *Nyctanassa violacea* had been seen in the park. At first I was incredulous, as the occurrence of this species in this latitude so early in the season is extremely unusual. Having approached within fifty feet of the bird I was able to assure myself of its identity. Unfortunately I was unable to secure the specimen. The bird allowed me to study it at close range for several minutes. At the expiration of this time it flew, confirming my opinion that its wings were not clipped. The bird was observed by many others. The next day, although I searched diligently, I was unable to find it.—NATHAN F. LEOPOLD, JR., *Chicago, Ill.*

The Black Vulture (*Catharista urubu*) in Indiana.—Professor Butler, in his 'Birds of Indiana' p. 769, states that the Black Vulture is "Resident in the southern part of the State; generally not numerous, but, in the lower Wabash Valley, at least from Knox County southward, it is common." Mr. McAtee, in his 'Birds of the University of Indiana,' notes the bird as quite rare in the State.

While en route from St. Louis to Washington on May 5, 1918, over the B. & O. Southwestern R. R., about five miles east of North Vernon, in Jennings County, Indiana, I saw two Black Vultures just after they had risen from the ground near the train and were ascending some thirty feet, where they joined a Turkey Vulture which was leisurely sailing around the locality.—R. W. WILLIAMS, *Washington, D. C.*

The Status of *Buteo platypterus iowensis*.—The new race of *Buteo platypterus* described by the late Prof. B. H. Bailey as *Buteo platypterus iowensis* ('The Auk,' XXXIV, No. 1, January, 1917, p. 73) was based on a specimen from Eagle Lake, Hancock County, Iowa. Its distinction from *Buteo platypterus platypterus* consists in its sooty brown plumage both above and below; and its geographic distribution extends from Manitoba to Iowa. It develops, however, on further investigation that examples of *Buteo platypterus* of the ordinary light type inhabit the same breeding range in Manitoba, Minnesota, and North Dakota. Since, of course, two geographic races of the same species cannot have identical breeding areas, it follows that we must seek some other reason for the existence of the dark Broad-winged Hawks that live in the upper Mississippi Valley. Mr. Robert Ridgway has already recorded (Proc. U. S. Nat. Mus., IX, 1886, p. 248) a dark *Buteo platypterus* from Iowa as an example of melanism in this species; and this evidently is the correct explanation. That nearly all these dark birds come from Iowa, Minnesota, and Manitoba is interesting, but does not militate against the view of their melanistic character, for it is well known that melanism and similar color phases may occur in one part of the range of a species and be totally absent in another. Furthermore, melanism in the genus *Buteo* is of common occurrence; and notable examples of this are *Buteo borealis*, *Buteo swainsoni*, and *Buteo ferox*. From the foregoing it seems necessary to treat *Buteo platypterus iowensis* as a synonym of *Buteo platypterus platypterus*.—HARRY C. OBERHOLSER.

Flight of Horned Owls in Canada.—The article by Mr. Arthur W. Brockway in 'The Auk' (Vol. XXXV, No. 3) upon the 'Large Flight of Great Horned Owls and Goshawks at Wadlyme, Connecticut' has prompted me to revert to the subject in connection with the phenomenon here. Any occurrence of this nature is particularly interesting and especially so among the Raptores of the North.

His information regarding the early November flight in Canada is perfectly correct; vast numbers having appeared at that time throughout the country. Mr. C. W. Nash, of the Provincial Museum, Toronto, informed me that hundreds of Great Horned Owls were noted in that region and in every locality that I have visited the same news of excessive numbers of these birds has reached me.

During the latter part of October, 1917, and the fore part of November I was in the wilderness northeast of Lake Superior. During my entire time there, I never once heard an owl, although they are frequently heard in wilderness camping. I remarked on the apparent absence of the species at the time, and often sat alone on the quiet shores of the lake at night, listening for the voice I had learned to enjoy, but not once did a lonely "hoot" disturb the silence of the solitude.

Every one there also remarked on the scarcity of the Varying Hare, as compared with the numbers usually present. After the first fall of snow

I noted occasional signs, and also procured a specimen, but their numbers were negligible. Grouse too, were scarce.

The significance of the whole thing dawned upon me when on November 7, the first day after my return to Southern Ontario, I noted several Horned Owls, which was an uncommon occurrence. The day previous a friend had observed three. These birds were lazily perched in the open hardwoods enjoying the sunshine, and quite apparently oblivious to their surroundings. This is contrary to the usual secretive habits of the birds when here.

Continuously throughout November these owls were frequently observed and many were shot for taxidermic purposes. After this month their numbers were reduced but signs of their killing, usually a luckless Cottontail, was noted with greater frequency than is usually the case.

Personally, the ingress of Goshawks was not noted as exceptional, although greater numbers may have prevailed in other localities. Each fall sees a certain influx of these destructive birds, with their bold propensities for domestic fowl, much to the vexation of most poultry-men.

To reiterate: The point of interest lies in the fact that the Horned Owls were apparently absent from the north country at the time of my trip October 20–November 6; common on my return to Preston, Ont. November 7, and apparently so at other points in southern Canada; with their subsequent invasion of the northern States, which I assume immediately followed as indicated by Mr. Brockway's communication to 'The Auk.'—J. DEWEY SOPER, *Preston, Ont.*

***Picoides arcticus* in Florida.**—Through the courtesy of Mr. J. D. Allen, of Mandan, North Dakota, the writer is privileged to record a specimen of the Black-backed, or Arctic, Three-toed Woodpecker (*Picoides arcticus*), which Mr. Allen collected himself on Pablo Creek, northeastern Florida, about March 20, 1875. Pablo Creek enters the St. John River a few miles west of Mayport, and the point at which this Three-toed Woodpecker was taken lies well up toward the source of this stream, which would make it some distance southwest of Mayport, the exact number of miles being now not determinable. The specimen is an adult male in perfect plumage, although by reason of being mounted is now in somewhat dilapidated condition. It has never been out of Mr. Allen's possession, and his recollection of the circumstances of its capture are perfectly clear and conclusive. It is an astonishing record for the State of Florida, and one that is not likely ever to be duplicated. The occurrence of a far northern species such as this so far south of its normal range naturally invites speculation as to the probable cause of its presence there, but it certainly was not a cage bird.—HARRY C. OBERHOLSER, *Washington, D. C.*

Early Nesting of the Northern Pileated Woodpecker in Pennsylvania.—According to the experience of field oölogists of Pennsylvania, the right time to find fresh clutches of the Northern Pileated Woodpecker

(*Phlæotomus pileatus abieticola*) in this State is May 10-15, consequently I was surprised to find a nest on May 20, 1918, in northern Huntingdon County containing three nestlings about one week old. The nest was seventy feet up in the dead top of a large rock oak in a thick forest.

Judging by the age of the young birds and allowing eighteen days for the incubation of the eggs, this early pair must have had a fresh set about April 25.

Three other nests found by Richard C. Harlow and the writer this year, in the same county held fresh and slightly incubated eggs on May 16 and 17, respectively.—RICHARD F. MILLER, *Philadelphia, Pa.*

Relative Length of the Intestinal Cæca in Trogons.—In his article on 'The Anatomy of the Cuban Trogon' in 'The Auk' for July, 1918 (p. 286), Dr. H. L. Clark records the length of the intestines and cæca of this trogon and remarks "The cæca are thus relatively very long, much longer than in the species of Trogon and *Pharomacrus* examined by Garrod."

I have examined the viscera of twelve specimens, representing six species, of Central American Trogons. These with the four individuals recorded by Garrod and Clark give us for comparison a total of eight species belonging to three very distinct groups of Neotropical Trogonidæ. The following figures express the ratio of the length of the cæca to that of the intestines, the latter being represented by 100.

<i>Pharomachrus mocinno</i>	(7 specimens),	9.3
<i>Trogonurus mexicanus</i>	(1 specimen),	10.6
" <i>puella</i>	(2 specimens),	13.8
" <i>curucui</i>	(1 specimen),	14.6
<i>Chrysotrogon caligatus</i>	(1 specimen),	16.2
<i>Trogonurus elegans</i>	(2 specimens),	16.7
<i>Trogon melanocephalus</i>	(1 specimen),	17.2
<i>Priotelus temnurus</i>	(1 specimen),	17.8

Thus in *Pharomachrus* the cæca average slightly more than one-eleventh of the total length of the intestinal tract, while in *Priotelus* they exceed one-sixth of the intestinal length. In *Pharomachrus* they are relatively shorter than in the other genera but *Trogonurus mexicanus* connects the two groups. The figures indicate that the cæca of *Priotelus* are a trifle longer than those of *Trogonurus*, *Chrysotrogon* and *Trogon*, but there is great individual variation in the length of these appendages and additional specimens will undoubtedly show that there is at most only a slight average difference.—W. DEW. MILLER, *American Museum of Natural History, New York City.*

The Range and Status of *Aphelocoma californica hypoleuca* Ridgway.
—As information supplemental to Mr. H. S. Swarth's excellent revision

of the North American forms of the genus *Aphelocoma* occurring on the Pacific coast (Univ. Calif. Publ. Zool. Vol. 17, No. 13, Feb. 23, 1918, pp. 405-422), the following may be of interest:

The lack of pertinent material has led Mr. Swarth to restrict the distribution of *Aphelocoma californica hypoleuca* to the extreme southern end of the Lower California peninsula, and because its range is thus seemingly isolated, to consider it a species distinct from *Aphelocoma californica*. Material in the Biological Survey Collection in the United States National Museum proves that jays of the *Aphelocoma californica* type have a practically continuous distribution throughout Lower California. Mr. Swarth refers to *Aphelocoma californica obscura*, or, as he calls it, *Aphelocoma californica californica*, specimens from Santana, which is some distance south of the San Pedro Martir Mountains, and about one-third of the way down the peninsula to Cape San Lucas, at approximately north latitude $29^{\circ} 20'$. Birds from Yubay, Lower California, which lies only a short distance southeast of Santana in about north latitude $29^{\circ} 15'$, are decidedly intermediate between *Aphelocoma californica hypoleuca*, of the Cape San Lucas region, and *Aphelocoma californica obscura* of the San Pedro Martir Mountains, being darker both above and below than the former, but not sufficiently so to be referred to the latter. Birds from Calmalli, some distance farther southward, at about north latitude $28^{\circ} 15'$, are nearly the same, though nearer in characteristics to *Aphelocoma californica hypoleuca*; and a specimen from San Andres, between Yubay and Camalli, is similar. These seven specimens, together with specimens from San Bruno and Mulejé, which lie still farther to the south, form a complete chain of intermediates between *Aphelocoma californica obscura* and *Aphelocoma californica hypoleuca*, making necessary, of course, the use of a trinomial for the latter. The geographic distribution of *Aphelocoma californica hypoleuca* should, therefore, be extended from the region about Cape San Lucas northward to the vicinity of Yubay, Lower California, at approximately North Latitude $29^{\circ} 15'$.—HARRY C. OBERHOLSER, *Washington, D. C.*

The Starling at Plattsburg, N. Y.—While at the second officers' training camp, I observed a flock of five Starlings (*Sturnus vulgaris*) flying over the town some time the first week in October, 1917. It is believed that this is the farthest north that this species has been noted.—LUDLOW GRISCOM, *2nd Lieut., Inf., O. R. C.*

The Northernmost Record of *Icterus parisorum*.—While engaged in field work for the Biological Survey, the writer was fortunate enough to obtain a specimen of *Icterus parisorum* in central western Nevada, which considerably extends the range of the species. This bird is an adult female and was taken in the mountains ten miles east of Stillwater, Nevada, and northeast of Carson Lake. It was obtained on May 11, 1898, among

the junipers in a little valley, and was accompanied by its mate, which Mr. Vernon Bailey was fortunate enough to collect at the same time. These captures extend the known range of the species one hundred miles north of Queen Mine, in the White Mountains of Nevada (*cf.* Fisher, *North American Fauna*, No. 7, 1893, page 76), its previous limit in this region. They also form the northernmost record of the species.—HARRY C. OBERHOLSER, *Washington, D. C.*

The Slate-colored Junco (*Junco hyemalis hyemalis*) breeding near Boston.—On June 4, 1918, Miss Agnes J. Galligan discovered a pair of Juncos (*Junco hyemalis hyemalis*) in some rocky oak woods in West Roxbury, Mass. I visited the place with her on June 7 and found the male bird with one young one in the speckled juvenal plumage, pretty well fledged and able to fly. We did not see the female, and we saw but the one young bird, though I thought at one time that I heard another calling. The note of the young was a trisyllabic *zŭ-zŭ-zŭ*. On July 1, Miss Galligan found the pair in another locality, about an eighth of a mile away, feeding a young bird which was evidently of a second brood, as it could not fly and was apparently just out of the nest. I visited the spot July 3, but saw nothing of the birds in the limited time at my disposal, though I heard the male singing. The breeding of the Junco in eastern Massachusetts is sufficiently uncommon to make the occurrence seem worth recording, especially as it is evident that two broods were hatched. West Roxbury is a part of Boston, and I know of no previous record of the breeding of this species within the limits of that city.—FRANCIS H. ALLEN, *West Roxbury, Mass.*

Blue-winged Warbler Once More Nesting at South Sudbury, Mass.—On May 24, 1918, in a walk in South Sudbury in the Wayside Inn region, I came upon a Blue-winged Warbler (*Vermivora pinus*) singing. The location was within a mile of the nesting in 1909, recorded in 'The Auk,' Vol. XXVI, October, 1909, pp. 337-345. The bird disappeared after several repetitions of his song before I had secured a view of him. But there remained in my mind no uncertainty that I had heard the song of a Blue-wing. This assurance, however, was happily substantiated by Mr. Richard M. Marble, to whom I had mentioned the occurrence, who, visiting the locality on June 19 and again on July 2, both times found the bird singing at the same spot where I had heard him on May 26. Mr. Marble writes me that he regrets that he did not have time to look for the nest. But the fact of a male in song being present from May 24 to July 2, a period of forty days, would indicate with reasonable certainty that once more a pair of Blue-wings had nested in this region. The locality was quite different from that of 1909, being a rather dry extent of second growth in the rear of a sandy woodlot of white pines and a variety of deciduous trees, but well supplied with undergrowth. In this woodlot we

have been accustomed to find year by year two or three Blackburnian Warblers (*Dendroica fusca*) singing throughout the month of May upon their arrival, and continuing in June on the testimony of other observers, giving assurance that the Blackburnian is a resident bird in this wood. The Blue-headed Vireo (*Lanivireo solitarius solitarius*) is also found year by year singing there much beyond the time of its migration. Both of these species were represented in song on May 24, June 19, and July 2 of the present year. Thus was had the unusual experience of hearing a Blue-winged Warbler sing with one ear and Blackburnian Warblers with the other, as probable nesting species. If the testimony presented may be accepted as furnishing reasonably reliable evidence of a nesting of Blue-winged Warbler in this locality in 1918, it may go on record as the second authentic occurrence in this region of Massachusetts, South Sudbury having the distinction of possessing both nestings within her borders.—HORACE W. WRIGHT, *Boston, Mass.*

A Winter Record of Bewick's Wren from Northern Virginia.—

On my way to the cars at Falls Church, Va., the morning of February 8, 1918, I was surprised by having a Bewick's Wren (*Thryomanes bewicki bewicki*) fly up from the ground and alight on the top of a fence within a foot or so of my face. From the fence it flew down to a small stub where it sat for about a half minute, affording me an excellent unobstructed view at only a few feet distance, before it finally hopped under a box bush where I had to leave it. The past winter has been one of the worst in this vicinity for a number of years, with the ground covered with snow and ice from early in December until after the event recorded above. Bewick's Wren is more or less rare and local in this locality at any time but not an uncommon breeding bird some fifty miles west of here, in the Blue Ridge Mountains.—J. H. RILEY, *Washington, D. C.*

Russet-backed Thrush (*Hylocichla ustulata ustulata*) in New Mexico.—Some time ago, in identifying some other specimens of the genus *Hylocichla* in the United States National Museum, the writer unearthed a specimen of *Hylocichla ustulata ustulata* from New Mexico. It is No. 130328, U. S. Nat. Mus., an adult male, taken by Dr. E. A. Mearns on May 3, 1892, about one hundred miles west of El Paso, at the so-called "Upper Corner" Monument No. 40 on the Mexican boundary line, which is in the extreme southwestern corner of Luna County, New Mexico. There is, so far as I am aware, no previous authentic record of this subspecies from the State of New Mexico.—HARRY C. OBERHOLSER, *Washington, D. C.*

Notes from the Vicinity of Washington, D. C.—The following notes from localities within ten miles of the Capitol seem worthy of record.

Hydrochelidon nigra surinamensis. BLACK TERN.—Three were seen May 3, 1917, and about a dozen May 12, 1917, over Hunting Creek,

just below Alexandria, Virginia. As far as I am aware, this is the first time Black Terns have been seen in this vicinity in spring, though there are several autumn records.

***Botaurus lentiginosus*.** AMERICAN BITTERN.—One was seen near Dyke, Virginia, on May 2, 1918. The latest previous spring record of which I am cognizant is April 30, 1859.

***Spinus pinus*.** PINE SISKIN.—Two flocks containing about 35 individuals were seen October 22, 1916, above Cabin John, Maryland. Fall records of Siskins seem to be rare, and this is two days earlier than any previously recorded. Throughout the autumn of that year Siskins were quite common.

***Passerherbulus henslowi henslowi*.** HENSLow SPARROW.—One seen near New Alexandria, Virginia, April 1, 1917. The average date of arrival for this species is about April 18, and the earliest previous record April 10, 1889. This record was inadvertently reported by Dr. H. C. Oberholser (Bird-Lore, XIX, page 153) as March 25.

***Oporornis formosus*.** KENTUCKY WARBLER.—Heard in Zoölogical Park, April 26, 1917, one day earlier than previously recorded.

***Geothlypis trichas trichas*.** MARYLAND YELLOW-THROAT.—One seen above Cabin John, Maryland, October 22, 1916. The latest previous fall record for this species is October 21, 1895.

***Polioptila cærulea cærulea*.** BLUE-GRAY GNATCATCHER.—On January 1, 1917, a Blue-gray Gnatcatcher was observed for some time at the Arlington Experiment Farm, Virginia. It was very active and several times uttered its characteristic squeaking note. As far as I am aware, this is the first record of the occurrence of the species near Washington in winter. Through a clerical error this occurrence was recorded by Dr. H. C. Oberholser (Bird-Lore, XIX, page 153) as January 2. The average date of spring arrival is April 7, and the earliest March 30, 1907.—M. T. COOKE, *Washington, D. C.*

Scarcity of Birds in the Spring Migration of 1918.—I have seen no reference, either in 'The Auk' or 'Bird-Lore,' to a general scarcity of birds this year, especially of the warblers and other small birds.

Here, the robins, grackles, starlings, and, perhaps, the thrashers, are as numerous as usual; the jays, and, perhaps, the towhees, more so. Taking the birds as a whole, however, the difference from other years may be indicated by the following figures:—best record to June 30, 104; average record to June 30, for fourteen years, 91; this year, 67.

Not only is the number of species seen notably smaller, but the number of individuals is smaller. For instance, I could count on the fingers of one hand all that I have seen of such common warblers as the Redstart, Wilson's, the Blackpoll, Black-throated Blue, Black-throated Green, Black-and-White; and the record is not much better for the Myrtle, the Yellow, and the Maryland Yellow-throat.

I might say the same thing about the Vireos, and the Flycatchers.

The testimony of every bird student with whom I have talked, either here or in Central Park, New York, is in entire harmony with my own experience.—ROBT. BARBOUR, *Montclair, N. J.*

Notes on Six Birds from Georgia.—*Sturnus vulgaris*. STARLING.—A young male was shot near Savannah by Mr. Ernest Cunningham on November 11, 1917, and brought to Mr. Gilbert R. Rossignol, Jr., who preserved it and presented the specimen to me. This is the first occurrence of this bird in Georgia.

***Piranga erythromelas*.** SCARLET TANAGER.—Among a collection of birds, made near Savannah by Mr. Troup D. Perry, and which I have acquired, is a male of this species that was taken by Mr. Perry on October 14, 1906. The Scarlet Tanager is a very rare bird in the south Atlantic States particularly on or near the coast and I have yet to detect it in the autumn in South Carolina.

During the past thirty-five years that I have devoted to ornithology in South Carolina I have seen but four birds, three of which I procured, as follows: April 30, 1889, an adult male taken on Oakland plantation, Christ Church Parish; May 4, 1911, a fine adult male taken, the late Dr. Edgar A. Mearns being at my side when I shot it; May 1, 1912, a male in very high plumage, Dr. Louis B. Bishop being near me when I shot it. The other specimen was seen on April 29, 1884, on the plantation of Mr. F. W. Heyward near Oakley and about thirty odd miles from Charleston.

***Vermivora pinus*.** BLUE-WINGED WARBLER.—Mr. Gilbert R. Rossignol, Jr., shot on September 6, 1909, near Savannah, a beautiful male of this bird and presented it to me. The Blue-winged Warbler is very rare in the south Atlantic States and I have yet to see one alive.

***Dendroica dominica albilora*.** SYCAMORE WARBLER.—I have an adult male of this western form of *D. dominica* taken by Mr. D. V. Hembree at Roswell, Ga. (near Atlanta), on July 2, 1913. This bird was from the collection of Mr. Troup D. Perry and labeled by Mr. Hembree "Yellow-throated Warbler." The superciliary stripe is almost immaculate white, there being the faintest tinge of yellow when placed under a magnifying glass. This bird is in high plumage and the yellow of throat intense and hence not faded, and without doubt was mated and raised a brood of young at Roswell for the date on which it was taken was too early for a migrant from some other region, as birds do not migrate in the autumn, that is land birds, until they have renewed their plumage — and this one had not done so.

***Thryomanes bewicki bewicki*.** BEWICK'S WREN.—Mr. Perry shot near Savannah on March 19, 1909, a fine male Bewick's Wren, which is the only one he has ever seen during all the years he has been observing birds near his home in Savannah. This specimen is now in my collection. Bewick's Wren is a bird of the Upper Austral Zone during the breeding season in North and South Carolina as well as Georgia, and it is resident even in the mountains of North Carolina where I have seen and heard it

sing during the coldest winters. That a few migrate to the coast of South Carolina and Georgia at times is evinced by the capture of one by Mr. Herbert Ravenel Sass at the Navy Yard, Charleston, on October 17, 1907, and by the writer seeing one near his home on October 16, 1907. (See Bull. Chas. Mus. III, 1907, 54; and Auk, XXV, 1908, 87.)

Hylocichla aliciae bicknelli. BICKNELL'S THRUSH.—In the collection of birds received from Mr. Perry there is a very small specimen of this race that is wrongly labeled by him "Olive B.[acked] Thrush." Although the sex was not determined it is doubtless a female, and was taken at Savannah by him on May 16, 1910. There is a malformation of the maxilla which is very nearly a quarter of an inch shorter than the mandible. Upon comparing this bird with specimens of *aliciae* from South Carolina, in which both males and females are represented, Mr. Perry's bird is an inch smaller in length than any female I have and the "make up" of the bird is much lengthened. Bicknell's Thrush is a rare bird in South Carolina, and I have taken but a single individual on May 10, 1900. How this bird manages to reach its breeding grounds in the Catskills and Nova Scotia without passing through South Carolina, is a puzzle.—ARTHUR T. WAYNE, *Mt. Pleasant, S. C.*

RECENT LITERATURE.

Dwight's Review of the Juncos.¹—Dr. Dwight, in the brochure before us, has contributed to ornithological literature a philosophical discussion of a high order. His paper is most welcome not only because we have too few of like character, but also because of the amount of painstaking study and deep thought that this especial treatise represents.

The paper may be considered under two heads, (1) as a systematic arrangement of the species and subspecies of the genus Junco, and (2) as an attempt to define by criteria the species, subspecies and hybrid.

The results from a systematic point of view may conveniently be compared with those of Mr. Robert Ridgway's study of the same group. Comparison with the A. O. U. 'Check-List' is hardly necessary since it is no secret that the arrangement of the genus there adopted was in the nature of a compromise and represented no detailed original research. Comparing, therefore, the species and races recognized respectively by Dwight and Ridgway and the names employed by them we find that each

¹The Geographic Distribution of Color and of other variable Characters in the Genus Junco: a new Aspect of specific and subspecific Values. By Jonathan Dwight, M. D. Bull. Amer. Mus. Nat. Hist., Vol. XXXVIII, Art. IX, pp. 269-309. June 1, 1918.

distinguishes nineteen kinds of Juncos, although two of these, *montanus* and *dorsalis*, regarded as species by Ridgway, are considered to be hybrids by Dwight and therefore unworthy of formal recognition in his scheme. In the other forms the names employed are identical in thirteen cases and in three of the remaining four they differ only in being treated as subspecies by Dwight and as full species by Ridgway. The other form *shufeldti* of Ridgway is renamed *couesi* by Dwight on the rather questionable claim that the type specimen of *shufeldti* is a winter straggler of *oreganus*.

That Mr. Ridgway, always a "liberal" in the matter of geographic races, and Dr. Dwight, a pronounced "conservative" in systematic work, should come to such substantial agreement is doubly gratifying because it was unexpected, and we have the satisfaction of feeling that the arrangement of the Juncos is substantially settled. Viewed from the second standpoint Dr. Dwight's paper opens up a wide field for discussion. Years ago in 'Science' Drs. C. Hart Merriam and J. A. Allen engaged in a lengthy discussion on the relative values of intergradation and degree of difference in the designation of species and subspecies. Whether we are any nearer to a solution of the problem now than we were then or whether the determination of what is a subspecies and what is a species can, from the very nature of the case, ever be anything but a matter of individual opinion is a question.

Dr. Dwight lays down the law that "The species is the unit; the subspecies is part of the unit; and the hybrid is an individual that is part of two units," and again states that: "a species has one or more intrinsic characters or a combination of characters not shared by another species. The characters are qualitative," while "a subspecies shares all the characters of its parent species in greater or less degree. The characters are quantitative and without a break in the continuity."

This is all very well but would we not be quite as justified in saying that the subspecies is the unit and that the species is an assemblage of subspecies having certain characters in common? Furthermore how are we always to distinguish between qualitative and quantitative characters? We must all admit that a species in the course of evolution is derived from a subspecies and we must therefore necessarily find all intermediate stages in the change from quantitative to qualitative characters and in deciding where to draw the line we are confronted by the same old problem which is bound to bring in personal opinion. Dr. Dwight is apparently endeavoring to devise a method of naming specimens from the characters which they present and no doubt intentionally he discards so far as possible the geographic problems involved — isolation, intergradation, environment etc. This it seems to the reviewer we cannot do. We are naming forms which are the result of evolution and are bound to consider every factor involved. We necessarily find species and subspecies differing from one another by every conceivable degree of difference and no set of criteria will serve as a rule by which everyone can decide which forms are species, which subspecies and which are not worthy of recognition at all. We cannot solve

such a problem by mathematical rules or with mathematical accuracy because systematic zoölogy is of necessity not an exact science.

To take an example from another group we wonder how Dr. Dwight would arrange the smaller Thrushes according to the criteria which he has laid down. Could not the differences between the Olive-backed and Gray-cheeked Thrushes be regarded as quantitative or qualitative according to the viewpoint of the individual? As a matter of fact the Gray-cheek was regarded as a subspecies of the Olive-back until it was found that forms of the two bred side by side without intergradation. In this connection it is interesting to note Dr. Frank M. Chapman's method of handling the subspecies problem in his recent work on the birds of Colombia. He says; "To lay down a certain rule and blindly be governed by it, is to handicap one's discrimination and experience. . . . The degree, and particularly the character of the differences exhibited, range, environment, faunal areas, the relative plasticity of the species in question, the action of other organisms in the regions concerned under similar circumstances, these and other factors, such as habits, voice etc., are to be considered in reaching a conclusion regarding the status of any form."

In this discussion we would not be understood as reflecting upon the excellent work that Dr. Dwight has done on the Juncos with the results of which we are in substantial accord. Furthermore we have always believed (cf. The Condor, March, 1903) that a plan might be devised — an arbitrary consensus of opinion if need be — by which a long series of races widely divergent at the extremes of the series but all apparently intergrading, could be broken up into specific groups, while forms widely separated geographically but differing very slightly from one another could be regarded as subspecies. A happy compromise as it were between the 'degree of difference' principle and that of 'geographic intergradation' which would vastly enhance the meaning which our names are supposed to convey. This is apparently just what Dr. Dwight is striving for but that any set of rules can be laid down by which anyone may determine the proper rank of a given form seems from the very nature of the case impossible.

One point that Dr. Dwight brings up in connection with his discussion of the race of *Junco oreganus* deserves special consideration. At a single locality within the range of *J. o. thurberi* he finds some breeding specimens which would on color alone be better referred to *J. o. oregonus* and *J. o. couesi* and he contends that if we are naming the birds and not the locality, these specimens should bear the names of these races rather than that of the race to which the vast majority of the individuals at that locality belong. Here our author is disregarding everything but color. It is a foregone conclusion that all the breeding birds at this locality belong to the same stock and should bear the same name with a comment if need be on aberrant characters. They are simply evidence of that intergradation of the three forms which shows them to be subspecies. This intergradation may be found in the area where the breeding ranges join, in which case it is manifest in a majority of the individuals, or it may be found in a large

series well within the range of any one of the races, where it will be manifest in only a few individuals. The serious point is that migrating or winter individuals are often recorded as representatives of races not normally to be found in the locality in which they are taken, whereas as Dr. Dwight shows they may very likely be merely aberrant examples of the race regularly occurring there — individuals such as we have been discussing. Such records in the case of slightly differentiated races had better not have been published no matter how experienced the authority who has identified them, and they should be given very slight attention in connection with questions of distribution or migration.

In discussing this matter Dr. Dwight in order to emphasize his points makes use of two provisional names '*cismontanus*' and '*transmontanus*' which cannot according to our code of nomenclature be construed in any other way but as new names which will become synonyms respectively of *Junco hyemalis hyemalis* and *J. oreganus couesi* although there is no knowing when they may come in for serious consideration should it be deemed desirable to erect other races or should one of the above names become invalid. They will then form bad stumbling blocks for the systematist as no types or type localities are mentioned. Dr. Dwight departs from the rules of nomenclature too when he emends Townsend's name *oreganus* into *oregonus* for which there seems no excuse since Oregon was the spelling generally used in Townsend's time.— W. S.

Soper on the Birds of Edmonton.¹— Mr. Soper has prepared a briefly annotated list of 143 species found in the vicinity of Edmonton, Alberta, based upon his observations during the years 1912 to 1914 together with such notes on the region as occur in Macoun's 'Catalogue of Canadian Birds.' The whole makes a useful and apparently pretty complete list for the locality. In commenting upon the character of the bird life the author calls attention to the fact that Edmonton is in the same latitude as southern Labrador and Ungava although its climate compares favorably with that of southern Ontario which accounts for the presence of many birds which would hardly be expected at such a high latitude.— W. S.

Wood on the Birds of Alger County, Michigan.²— To further the work of the University of Michigan's zoölogical explorations in the Upper Peninsula, Mr. George Shiras, 3rd., placed his summer home in Alger County at its disposal as a field headquarters and the present paper comprises a list of 120 species of birds observed there by Mr. Wood during a residence, from May 24 to July 27, 1916. The list is briefly annotated and some previous observations of Mr. Shiras are included.— W. S.

¹ The Birds of Edmonton. By J. Dewey Soper. The Ottawa Naturalist, February and March, 1918. pp. 129-134 and 145-149.

² Notes on the Birds of Alger County, Michigan. By Norman A. Wood. Occasional Papers, Mus. Zool. Univ. of Mich., No. 50, April 8, 1918. pp. 1-15.

Bangs on New South American Birds.¹—In a review of the races of *Tangara gyroloides* Mr. Bangs describes as new *T. g. nupera* (p. 76) the form found in western Ecuador, formerly considered identical with the *T. g. bangsi* ranging from Costa Rica to Veragua. In conjunction with Mr. G. K. Noble he has described a new woodpecker, *Chrysoptilus atricollis lymani* (p. 85) from Huancabamba, Peru.—W. S.

Wetmore on Duck Sickness in Utah.²—The present bulletin is a final report upon the investigations conducted by Mr. Wetmore on behalf of the U. S. Biological Survey in the vicinity of Great Salt Lake, where the mortality among water fowl has been particularly noticeable. A preliminary report was issued in 1915 and reviewed in 'The Auk' for October of that year. The present paper while going into the subject in much greater detail confirms the conclusions set forth in the preliminary report that the trouble was due to the water becoming charged with alkali. Certain salts contained in it, notably chlorides of calcium and magnesium, have been shown by actual experiment to produce the duck sickness.

The way in which the birds become infected is described by Mr. Wetmore as follows. Irrigation has decreased the amount of water supplying the marshes on the lake front, and the resulting slow drainage induces stagnation over large areas. Surface evaporation and capillary attraction rapidly draw the salts held in solution in the mud to the surface and there concentrate them. Strong winds bank up the water in the larger bays and blow it over the drying flats taking up the salts in solution and carrying with it quantities of seeds and insects upon which the ducks feed eagerly taking in naturally quite an amount of the salts. Complete draining of affected areas, increase in the supply of fresh water and caring for the sick birds, which can in a large percentage of cases be brought back to perfect health, are recommended as means to counteract the trouble.

Mr. Wetmore has done an admirable piece of work in seeking out the cause of this malady which has become a serious menace to ducks in Utah as well as in regions to the south where these birds would naturally go in the winter season.—W. S.

Mathews' 'Birds of Australia.'³—Part II of Volume VII of Mr. Mathew's work is a bulky number dealing with the Kingfishers and the Bee-eater, eight species being figured. As was to be expected the composite genus *Halcyon* comes in for some serious treatment at the author's

¹ Notes on the Geographical Races of *Tangara gyroloides*. By Outram Bangs. Proc. N. E. Zool. Club, VI, pp. 73-76, December 21, 1917.

Description of a New Woodpecker from Peru. By Outram Bangs and G. K. Noble. Proc. N. E. Zool. Club. vi, pp. 85-86. June 7, 1918.

² The Duck Sickness in Utah. By Alexander Wetmore. Bulletin 672, U. S. Department of Agriculture, June 21, 1918. pp. 1-25.

³ The Birds of Australia. By Gregory M. Mathews. Part II, Volume VII. May 15, 1918.

hands and some twenty pages are devoted to a history of the nomenclature of the group and the relationship of the species. No less than fourteen new genera of Kingfishers are proposed so that with those previously available every really distinct species must now be provided with a generic name. It is not for us to criticise Mr. Mathews' work for upon the standards now prevailing in other families, this subdivision is apparently perfectly justifiable if one desires to be consistent, but it only goes to prove that the utility of the generic name is being reduced to *nil* and it would seem that the time is not far distant when we must begin the reverse process of grouping 'natural genera' together into 'genera de convenience' if the first term of our technical names is to mean anything more than the second. The more we use generic nomenclature to designate facts in differentiation the less use it becomes as a means of indicating to some one else what we are talking about.

In the discussion of *Syma torotoro* three new subspecies are described from New Guinea while one new race of *Dacelo leachii* from Australia and one from New Guinea are described. *Monarchalcyon cyanocephalus* Sharpe is renamed *Dacelalcyon confusus*.—W. S.

Grinnell on the Name of the American Barn Swallow.¹—Dr. Grinnell has brought up in this note a matter of no little importance. The Barn Swallow was originally described as *Hirundo erythrogaster*. In the first edition of the A. O. U. 'Check-List' it appears as *Chelidon erythrogaster* although Dr. Stejneger in referring it to this genus had written it *erythrogastra*. In the second edition where it is still referred to *Chelidon* and in the third where it is put back into *Hirundo* the feminized form *erythrogastra* is used. Recently Dr. Oberholser has claimed that the proper feminine of *gaster* is *gastris* and writes it *erythrogastris* and finally comes Dr. Grinnell with the explanation that the word is not an adjective at all but a noun and therefore should retain its original form *erythrogaster* under all circumstances. He seems to be absolutely right and the action of the original A. O. U. Committee should be upheld. In spite of all this Dr. Elliot Coues always employed *erythrogastra* and in commenting upon the form *Chelidon erythrogaster* said "wrong for genus and wrong for gender." It would be interesting to know what his argument in the case would be. It is perhaps one where even Latin experts will disagree.

A glance at the index to Sharpe's 'Hand-List of Birds' shows many discrepancies in handling such cases. Both *-gaster* and *-gastra* are used with feminine genera, *-venter* with both masculine and neuter and *-ventris* with masculine and feminine. So there seems much to correct no matter what view we adopt. Drs. Grinnell and Oberholser have apparently discovered another 'mare's nest' for the nomenclatorist.—W. S.

¹ The Name of the American Barn Swallow. By J. Grinnell. The Condor, XX, p. 92, March 19, 1918.

Nichols on Some Aspects of Migration.¹— Those who are interested in speculating upon the origin of bird migration will find much food for thought in this short article of Mr. Nichols. Referring to the irregular southward migrations of the Red-breasted Nuthatch and other species of similar habit, he advances the theory that these movements are the result of a great increase in abundance within the permanent range of the species from which it then sweeps outward as it were in waves. We have all noticed how few Nuthatches return northward in the spring following an enormous autumn flight and Mr. Nichols explains this by the suggestion that the bulk of them are utterly dissipated and lost, and that only a small minority ever find their way back to their permanent range. This type of migration he terms 'centrifugal,' and considers it to be the original condition. Next comes the condition where the species has become so adjusted to conditions as to maintain itself in unvarying though comparatively small numbers, here there is overcrowding and consequently no migration at all. Then come species that retire from one part of their range to another during winter but never leave it entirely, simply adjusting themselves to changed conditions; this is 'intraspecific' migration; and finally an extension of this condition where the winter and summer ranges become entirely separated and the passage from one to the other constitutes the 'centripetal' migration so familiar in our spring and fall migrants where "highly developed homing instincts in the individual bird take the place of the futile centrifugal 'wanderlust' of the race in its initial condition."

The irregular movements of the Red-bellied Nuthatch and similar species have always been a puzzle to students of migration and the failure of food supply in their regular range never appealed to the reviewer as an adequate explanation. Mr. Nichols' theory on the other hand has much to commend it.

While his last three conditions and the development one from the other have been pretty generally recognized and will be generally accepted we do not think that he has been very happy in the selection of the White-breasted Nuthatch as an example of an absolutely resident species that does not migrate at all. Certainly in many places familiar to the reviewer it is much more abundant in autumn and winter than at other seasons. It may indeed be difficult to find a species in which there is not some migratory movement within its range.— W. S.

Birds of the National Parks.²— Three of the National Park 'Circulars of Information' for 1918 — those for Glacier, Sequoia, and Yellowstone

¹ An Aspect of the Relation between Abundance, Migration and Range in Birds. By J. T. Nichols. *Science*, August 16, 1918. pp. 168-170.

² General Information regarding Glacier Park, season of 1918 (birds, pp. 52-64); *Ibid.*, Sequoia and General Grant National Parks (birds, pp. 20-27); *Ibid.*, Yellowstone National Park (birds, pp. 61-66). National Park Service, Department of the Interior. Free on application to the Director of the National Park Service, Washington, D. C.

National Parks — contain lists of birds. The list for Glacier Park, Mont., published this year for the first time is by Mrs. Florence Merriam Bailey and consists of brief notes on 184 species. Lack of space made it necessary to condense the statements as much as possible and consequently less than half a dozen lines are devoted to any one species. The list for Sequoia Park, Calif., including also the neighboring General Grant Park was prepared by the Superintendent, Walter Fry, and has been published each year since 1912. It contains 182 species but only about 50 of them are marked with an asterisk to indicate presence in General Grant Park. Evidently much more work remains to be done on the birds of this park. Moreover the notes are less than a line in length and are confined to mere statements of the status of each bird as "common resident" etc. The list for the Yellowstone Park, Wyo., is the work of M. P. Skinner and appears under his name for the first time, having been published anonymously in 1915, 1916 and 1917. It contains 194 species but the notes like those of the Sequoia list state merely whether the species are residents, summer residents, migrants, or occasional visitants. More space should be given such lists so that notes of local interest can be included and exact dates and localities given for species which occur irregularly or only occasionally.

When it is recalled that Glacier Park is larger than the state of Rhode Island, that the Yellowstone Park is two thirds the size of Connecticut, and that these reservations are visited by thousands of tourists every year, the importance of having complete and accurate lists of the birds can hardly be overestimated. Similar lists should be published at an early date for several of the other parks especially Crater Lake, Mount Rainier, Rocky Mountain and Yosemite.—T. S. P.

Economic Ornithology in Recent Entomological Publications.—

A decrease in items includable under this heading is apparent and the present fasciculus of papers noted is the whole fruit of more than six months waiting. The articles relate to:

The Rhinoceros beetle (*Oryctes rhinoceros*). This species kills annually something more than one percent of the coconut trees of the Philippine Islands entailing a yearly money loss of nearly three million dollars. The natural enemies are few but among them are two birds, the Philippine Crow (*Corone filipina*) and the common roller (*Eurystomus orientalis*).¹ Adults of the Rhinoceros beetles are of heavy build and from one and one half to two inches in length and the larvæ are even larger. It is to be inferred therefore that the large size of the insect is an important factor in limiting the number of its predatory enemies.

The round-headed apple-tree borer (*Saperda candida*). In the Ozark region of Arkansas whole apple orchards have been abandoned because of the destruction of trees by this pest. A single individual of the species

¹ Mackie, D. B. *Oryctes rhinoceros* in the Philippines. Philippine Agr. Rev. Vol. X, Fourth Quarter 1917, p. 326.

can kill a small tree and if two or three are present they are almost certain to cause death. The author of an extensive bulletin on this pest, states that he has seen evidences that woodpeckers prey upon the species in Ozark orchards, and that other natural enemies are few.¹ Other entomologists have testified to the value of woodpeckers in destroying larvæ of various species of *Saperda*, but it will be well also to draw attention to the fact that other birds feed upon adult *Saperda* and are of some value in keeping the species in check. These birds, so far as known, include the Magpie, Bluejay, Cassin's Kingbird, Red-eyed Vireo and Robin.

The southern corn rootworm (*Diabrotica duodecimpunctata*). This abundant flower beetle is the most familiar black-spotted yellow beetle over the whole United States. It is seriously destructive to corn in the southeastern states, its ravages frequently necessitating replanting. Full credit is given to its bird enemies in a Bureau of Entomology publication,² but more recent information makes it possible to improve upon the account. Thirty-seven species of birds are known to feed upon this species of *Diabrotica*. The largest number of specimens found in the stomach of a single bird was 18 taken by a Cliff Swallow. Twenty-three species of birds are known as enemies of the southwestern rootworm, a form which although called a separate species (*D. soror*) probably is only varietally distinct. The *Diabrotica* are typical of what are called warningly colored insects and which are supposed to be more or less shielded from predatory attack. The relations of birds to them however, give little comfort to believers in this theory.

The southern green plant-bug (*Nezara viridula*). This insect agrees with the last discussed, in being a pest in the south, and in belonging to the category of theoretically protected insects. The basis for the latter thought is alluded to in a recent statement³ about bird enemies. "In spite of the disagreeable odor of the species of the genus, the Bureau of Biological Survey has recorded finding specimens of *Nezara* in the stomachs of certain birds, but it appears to have been always *hilaris* that was found. *N. viridula* is probably also eaten."

Confirmation of this prophecy is now at hand as *N. viridula* has been identified in a number of stomachs of Franklin's Gull. From 20 to 40 specimens of the bug were taken by individual birds. The species has been found also in the stomach of Say's Phoebe. Probably many of the specimens from bird stomachs identified merely to the genus *Nezara* were of the species *viridula* for there is no reason to believe that discrimination would be shown. Thirty-one different kinds of birds are known to feed upon *Nezara*, further unidentified, and no fewer than 26 specimens were obtained from the stomach of a Purple Martin and 100 from a Franklin's Gull.

¹ Becker, Geo. G. Bull. 146, Ark. Agr. Exp. Sta., July 1918, p. 25.

² Luginbill, Philip. The southern corn rootworm and farm practices to control it. Farmers' Bull. 950, U. S. Dept. Agr., May 1918, p. 8.

³ Jones, Thos. H. The southern green plant-bug. Bull. 689, U. S. Dept. Agr., July 30, 1918, p. 21.

White grubs (*Lachnosterna* spp.). The award to birds of first place among natural enemies of white grubs, cited in 'The Auk' (Vol. 30, No. 4, Oct., 1913, p. 602) is repeated in a revision of the bulletin¹ there quoted. Added information is to the effect that: "The U. S. Biological Survey has found these insects in the stomachs of 78 species of birds and 2 species of toads.

Insects that carry stock diseases. The writer cannot forbear to add another to the contributions he has made to the discussion of the distribution of stock diseases. In the very first article on the subject,² the statement was made, regarding anthrax, that "The fact that the disease may be carried by flies is more than sufficient to explain the most severe epidemics" (p. 298). The author of one of the papers reviewed at that time now has published the results of further experimentation and reports³ the positive findings that the horn fly, horse flies and mosquitos are capable of transmitting anthrax by feeding upon a healthy animal after biting an infected one. In the face of such evidence, of which much was available years ago, the waging of a severe campaign against Turkey Buzzards as the most important carriers of stock diseases, is a deplorable example of popular disregard of scientific teachings.—W. L. M.

Centurus radiolatus in relation to Cocoa in Jamaica.—The Jamaica Woodpecker has been the subject of many complaints of doing damage to cocoa pods. The matter has been investigated by Mr. A. H. Ritchie, Government Entomologist, and his report has recently been published.⁴ By stomach analysis and field observation he finds that the normal food of the bird is fruit pulp, seeds and insects. Most of these items were specifically identified and lists of the names are given. Mr. Ritchie found no direct evidence of damage to cocoa, a conclusion supported by letters reproduced in the previous issue of the Journal (22, No. 2, February, 1918, pp. 65-69). Two or three writers state that they have long had standing rewards for woodpeckers with remains of cocoa pods or seeds in their crops, but have never had a bird presented. One of these writers also gives a number of stomach analyses. The investigation so far as it has proceeded, is clearly in favor of the Jamaica Woodpecker and the burden of proof of damage done rests upon the accusers.—W. L. M.

Further Notes on Possible Avian Distribution of Hog Cholera.—The full report of the experimental investigations of the distribution of hog

¹ Davis, J. J. Common White Grubs. Farmers' Bull. 940, U. S. Dept. Agr., May, 1918, p. 12.

² 'The Auk,' 30, No. 2, April, 1913, pp. 295-8. Succeeding articles are in Vol. 35, No. 2, April 1918, pp. 253-4 and in Farmers' Bull. 755, U. S. Dept. Agr., Oct. 26, 1916, pp. 37-9.

³ Morris, Harry. Blood-sucking Insects as Transmitters of Anthrax or Charbon. Bull. 163, La. Agr. Exp. Sta., March 1918, p. 15.

⁴ Journ. Jamaica Agr. Soc. 22, No. 3, March 1918, pp. 102-107. Issued separately and repaged 1-6.

cholera by pigeons, that was noticed in the last issue of 'The Auk,'¹ has now been published.² No further comment on the experiments is necessary except to state that the conditions were exceedingly severe and that the authors would have been justified in concluding that pigeons, and any other birds of similar habits, probably never are concerned in the spread of hog cholera.

Other experiments reported on in the same publication (pp. 102-115) are of interest in connection with the study of carrion feeders as distributors of the disease. One of the findings is that "fresh collected secretions and excreta [of the hogs] proved to be non-infectious when fed," with one possible exception. This disposes of one theory to the effect that buzzards may get the virus from hog droppings and distribute it. It was also shown that the flesh of rats which were fed on the meat of cholera hogs for periods up to three weeks was non-infectious when fed to susceptible animals. These findings, if of general application, so narrow the possibilities of transmission of hog cholera by carrion feeders, that there is no doubt a great mistake has been made in pronouncing buzzards guilty and even condemning them by statute, in advance of thorough and careful investigation of their relation to stock diseases.—W. L. M.

Recent Publications on Economic Ornithology.—The Biological Survey of the U. S. Department of Agriculture has issued its usual 'Directory of Officials and Organizations Concerned with the Protection of Birds and Game,'³ compiled this year by W. F. Bancroft, while another pamphlet⁴ described under 'Notes and News' deals with the Migratory Bird Treaty and its Regulations. Bulletin 715⁵ of the same Department, by W. L. McAtee is entitled 'Attracting Birds to Public and Semipublic Reservations' and should be in the hands of all park superintendents, as well as those in charge of cemeteries, school grounds, etc. County road supervisors too could learn a valuable lesson from its perusal.

From 'Bird Notes and News' we learn of the increase of insect pests in England owing to the abnormally large areas under cultivation and the decrease in the number of insectivorous birds during severe weather, a condition which brings forth strenuous appeals for the better protection of birds. On the other hand the War Agricultural Committees are advocating the total destruction of the Rooks which are however, known to be at certain seasons very beneficial, and much opposition to the order is manifested.

Mr. Oldys' 'Current Items of Interest'⁶ 'The Bluebird'⁷ and the

¹ Vol. 35, No. 2, April 1918, pp. 253-4.

² Journ. Agr. Research, Vol. 13, No. 2, April 8, 1918, pp. 125-129.

³ Issued August 19, 1918.

⁴ Issued August 26, 1918.

⁵ Issued August 12, 1918, price 5cts.

⁶ No. 37, June 29, 1918. No. 38, July 1.

⁷ Published monthly in co-operation with the Cleveland Bird-Lovers Association, 1010 Euclid Ave., Cleveland, Ohio.

'New Jersey Audubon Bulletin'¹ present a variety of notes on economic subjects.

'The Audubon Bulletin' of the Illinois Audubon Society² has become more than a mere bird conservation publication and the Spring and Summer issue for 1918 is full of local ornithological information of permanent value, the Snowy Owl coming in for considerable attention. Migration is also discussed and Mr. Frank Smith presents data to show the direct effect of weather conditions on the arrival of birds. The late expert on this branch of ornithology, Prof. Wells W. Cooke, held exactly opposite views (see Auk, 1913, p. 205) but the reviewer is inclined to favor Mr. Smith's contention.—W. S.

The Ornithological Journals.

Bird-Lore. XX, No. 4. July-August, 1918.

Notes on the Nesting of the Nashville Warbler. By H. E. Tuttle.

How I Mothered a Pair of Hummingbirds. By P. G. Cartlidge.

The Black-billed Cuckoo. By C. W. Leister.—Good photograph of the young.

Bird Walks. By Charles B. Floyd.—Brookline, Mass. Bird Club.

Spotted Sandpiper Colonies. By J. W. Lippincott.—Six nests in close proximity in one locality and three in another.

The Shrikes form the subject of the notes on migration and plumage with a colored plate by Fuertes.

The Condor. XX, No. 4. July-August, 1918.

Notes on the Nesting of the Redpoll. By Lee R. Dice.—On the north fork of the Kuskokwim River, Alaska.

A Return to the Dakota Lake Region. By Florence M. Bailey.—(Continued.)

The Yolla Bolly Fox Sparrow. By Joseph Mailliard—*Passerella iliaca brevicauda* (p. 139) subsp. nov., Yolla Bolly Mts., Trinity and Tehama Counties, California.

The Wilson Bulletin. XXX, No. 2, June, 1918.

A Hummingbird's Favorite Nesting Place. By F. N. Shankland.

A Second Bird Survey at Washington, D. C. By Harry C. Oberholser.—Seventeen parties saw in all 166 species and 17,074 individuals. Dr. Oberholser uses his own nomenclature instead of that of the A. O. U. Check-List and as only technical names are used a number of them are meaningless to the general reader.

Some Florida Herons. By John Williams.

Birds Observed near Minco, Central Oklahoma. By Alexander Wetmore.—(Continued.)

The Oologist. XXXV, No. 7. July 1, 1918.

¹ No. 26, July, 1918.

² 1649 Otis Building, Chicago, Ill.

Contains excellent photographs of a live Trumpeter Swan and the nest of a Dipper.

In a list of exceptionally large and other unusual sets Mr. R. M. Barnes gives a list of species in the nests of which he has found eggs of the Cowbird.

The Ibis. X Series, VI, No. 3. July, 1918.

Remarks on Hawks of the Genus *Micrastur*. By W. L. Sclater. With colored plate of the recently described *M. plumbeus* Sclater.

Ornithological and Oological Notes from the River Somme Valley at its mouth and near Peronne. By Major W. M. Congreve.

Further Ornithological Notes from the Neighborhood of Cape San Antonio, Province of Buenos Ayres. Part I. Passeres. By Ernest Gibson.—A valuable account in the form of a fully annotated list by a resident of the country for over forty years, with an interesting descriptive and historical preface.

A List of the Birds of the Anglo-Egyptian Sudan, based on the Collections of Mr. A. L. Butler, Mr. A. Chapman and Capt. H. Lynes and Major C. Cristy. By W. L. Sclater and C. Mackworth-Praed. Part I, Corvidæ-Fringillidæ. This is an important technical paper as might be inferred from the wealth of material upon which it is based. In the course of their critical studies the authors have had occasion to describe several new forms both from the Sudan and from adjoining regions. We note the following: *Estrilda astrild gaboonensis* (p. 443), new name for *E. rubriventris* Sharpe and Shelley, (nec Vieill.), *Anomalospiza butleri* (p. 460) Lado Enclave; *Serinus mozambicus tando* (p. 465), North Angola; *S. m. aurifrons* (p. 466) Sennar.

Further Notes on Birds Observed at Alix, Buffalo Lake, and Red Deer in the Province of Alberta, Canada, in 1915 and 1916. By Charles B. Horsburgh.

Bulletin of the British Ornithologists' Club. No. CCXXXIV. May 22, 1918.

Dr. Hartert described as new *Dicæum trigonostigma megastoma* (p. 74), Natuna Isls.; *D. t. flaviclunis* (p. 75), Java.

Bulletin of the British Ornithologists' Club. No. CCXXXV. July 25, 1918.

The following new forms were described: By Lord Rothschild; *Lioptilus abyssinicus ansorgei* (p. 78) Mucuo, Benguela; by Dr. Hartert, *Phænicurus frontalis sinæ* (p. 78), Kansu, China; by Mr. Charles Chubb, *Myrmophila vavasouri* (p. 83), Ituribisi River, British Guiana; *Rhopias spodionota juninensis* (p. 84), Junin, Peru; *Cercomacra cinerascens immaculata* (p. 84), Supenaam River, British Guiana; *C. tyrannina saturator* (p. 85), Ituribisi River, British Guiana; *C. t. pallescens* (p. 85), Esmeraldas, Ecuador; *Rhopoterpe torquata equatorialis* (p. 85), Sarayacu, E. Ecuador; *Hylopezas macularia macconelli* (p. 86), Ituribisi River, British Guiana; *Grallaricula nana kukenamensis* (p. 86), Kukenam Mts., British Guiana; *Furnarius leucopus hauxwelli* (p. 87), Pebas, Peru; and *Lochmias nematura castanota* (p. 87), Kukenam Mts., British Guiana.

British Birds. XII, No. 1. June, 1918.

Some New Facts about Grit. By Dugald Macintyre.—Sometimes ejected in castings, sometimes in droppings. Retention in the stomach determined by its condition, whether sharp or worn. Curlew eject the whole lining of the stomach with the grit inside, in autumn.

The Moults and Sequence of Plumages of the British Waders. Part VI. By Annie C. Jackson.

Bird Notes from Macedonia. By J. M. Harrison.

British Birds. XII, No. 2. July, 1918.

The Effect of the Winter of 1916–1917 on our Resident Birds. By Rev. F. R. C. Jourdain and H. F. Witherby. Part II.

The Moults and Sequence of Plumages of the British Waders. Part VII. By Annie C. Jackson.

British Birds. XII, No. 3. August, 1918.

The First Nesting Record of the Great Skua in the Orkneys. By Rev. F. R. C. Jourdain.

Heather and Grouse Disease. By Dugald Macintyre.—Considers climatic conditions, which cause a blight in the heather, the fundamental cause of 'grouse disease' although the immediate cause may be, as the grouse disease Commission reported, the presence of internal parasites.

Some Breeding Habits of the Sparrow Hawk. No. 6. By J. H. Owen.—Laying and Incubation.

Avicultural Magazine. IX. No. 7. May, 1918.

Nesting of the Long-eared Owl on the Ground. By J. H. Gurney.

Avicultural Magazine. IX, No. 9. July, 1918.

Puffins on the Saltee Islands. By G. E. Low.—With an interesting photograph of the colony.

The Austral Avian Record. Vol. III, No. 6. June 25, 1918.

Alfred John North, Ornithologist: An Appreciation. By Gregory M. Mathews.—With portrait.

On *Pachycephala melanura* Gould. By Gregory M. Mathews.

On *Turdus maxillaris* Latham. By Gregory M. Mathews.—The specific name as applied to the Australian *Sphecotheres* is rejected as Mr. Mathews considers that the Watling plate, here reproduced, cannot represent this bird which therefore becomes *S. vieilloti* Vig. and Horsf. The genus he would remove from the *Oriolidae* to the *Campophagidae* following Pycraft. The species *S. stalkerii* he thinks must have been taken in New Guinea and not in Australia as it has never since been found in the latter country.

A Forgotten Ornithologist. By Gregory M. Mathews and Tom Iredale.—Through the courtesy of Mr. C. Davies Sherborn an apparently rare and hitherto overlooked work by F. P. Jarocki, a Polish naturalist, is here described and considered in relation to ornithological nomenclature. The volume in question is the bird volume of a 'Zoologia' which was never completed, stopping for some reason with volume six. It appeared in 1821. A number of new generic names occur in Jarocki's work of which

the following demand recognition: *Phœniculus* replaces *Irrisor* Less; *Crimifer* must replace *Chizarhis* Wagl.; *Vestiaria* dates from here instead of from Fleming and *Remiz* replaces *Anthoscopus* Cab.

The most serious matter so far as American ornithology is concerned is however the presence of a genus *Cardinalis* based on the Scarlet Tanager! While this becomes a synonym of *Piranga* and does not affect the names of our Tanagers it antedates Bonaparte's name *Cardinalis* for the Cardinal Grosbeak and renders it untenable.

To meet this contingency the authors propose for the Cardinal the generic name *Richmondena* (p. 145) "as our small meed of recognition of the immense work, so invaluable as to be almost incalculable, performed by our friend Dr. C. W. Richmond, and the association of the name of our brilliant co-worker in the least showy side of ornithology with the brilliant Cardinal seems a pleasing item."

Incidentally the question of the genera in Oken's list (Isis, 1817) comes up for comment and Mr. Mathews contends that all or none of them should be accepted and that the A. O. U. Committee had no right whatever to accept those which happened to be in Latin form and reject *Eider*, *Moustache*, *Souchet* and *Macreuse*. With this opinion the reviewer has always been in hearty accord.

Validity of Some Generic Terms. By Gregory M. Mathews and Tom Iredale.—This is a consideration of the Lacépède genera under which no species are mentioned. The authors call for a definite decision by the International Commission as to whether the citation of species by a subsequent author validates the name from the date of such citation or from the original date of publication, or whether the original publication should be regarded as unrecognizable and any subsequent use of the name be forbidden.

It would seem to us that the opinion of the Commission quoted by Mr. Mathews to the effect that the genus be regarded as including all the species of the world that would come under the published diagnosis covers the case. Even though the diagnoses of the four genera of Accipitres — *Circus*, *Buteo*, *Astur* and *Milvus* — are not sufficiently definite to distinguish the four groups of species involved, we can nevertheless include all the known hawks under each, if necessary, and let the next user of the names restrict each one, which is the plan followed by the A. O. U. Committee. As a matter of fact we have very few cases of this sort and the danger of encouraging carelessness in the future by giving any recognition to such names is negligible.

South Australian Ornithologist. III, Part 6. April, 1918.

A Trip on the Coorong and Amongst the Bristle Birds on Younghusband Peninsula. By S. A. White.

A Sketch of the Life of Samuel White. By S. A. White.—An interesting biography continued in the July issue.

South Australian Ornithologist. III, Part 7. July, 1918.

A Visit to the Breeding Grounds of Swan and Pelican on the Coorong. By S. A. White.

Some Observations on the Nesting and the Young of Cormorants. By A. N. Morgan.

Revue Française d'Ornithologie. X, No. 108. April 7, 1918. [In French.]

An Apparent Hybrid between the Pigeon and Dove. By X. Raspail.

Revue Française d'Ornithologie. No. 109. May 7, 1918.

Birds of the Valley of the Ancre during the Winter of 1916-1917. By Capt. J. N. Kennedy.

On a Small Collection of Birds from the Belgian Congo. By A. Mene-gaux and Van Saceghem.— Continued in the next issue.

Revue Française d'Ornithologie. No. III. July 7, 1918.

On Color Vision and Color Sensitiveness in Birds. By R. Dubois.

Notes on the Ornithology of Tunis. By A. Blanchet.

Ardea. VII, No. 1-2. [In Dutch.]

Bird Migration Observations in Holland in 1917. By Dr. H. Ekama.

Report from the Netherlands Ornithological Experiment Station at Heumen. By Jan J. Luden Van Heumen.— An elaborate analysis of the food of the Wood Pigeon (*Columba palumbus*) and Turtle Dove (*Turtur turtur*) with detailed contents of stomachs and crops and extensive charts.

Ornithological Articles in Other Journals.¹

Grinnell, Joseph. Bird Migration in its International Bearing. (The Scientific Monthly, August, 1918.)

Beebe, William. A Kashmir Barrage of Hail. (Zoölogical Society Bulletin, May, 1918.) — Contains a list of western Himalayan birds.

Crandall, Lee S. Bird Life of a Big City. (*Ibid.*) — Contains a list of wild birds of the New York Zoölogical Park.

Brooks, Major Allan. Brief Notes on the Prevalence of Certain Birds in British Columbia. (The Ottawa Naturalist, February, 1918.)

Criddle, Norman. Bird Notes from Manitoba. (*Ibid.*, March, 1918.)

Johnson, C. E. Mammal Food of the Great Horned Owl. (*Ibid.*, April, 1918.)

Gormley, A. L. The Evening Grosbeak at Arnprior, Ont. (*Ibid.*) — Present every winter from 1912-13 to 1916-17, but absent last winter not only here but throughout eastern North America.

Saunders, W. E. A Protected Nest of the Bald Eagle. (*Ibid.*) — Nested in the same woods for the last 25 years.

Collinge, Walter E. On the Value of the Different Methods of Estimating the Stomach Contents of Wild Birds. (The Scottish Naturalist,

¹ Some of these journals are received in exchange, others are examined in the library of the Academy of Natural Sciences of Philadelphia. The Editor is under obligations to Mr. J. A. G. Rehn for a list of ornithological articles contained in the accessions to the library from week to week.

May, 1918.) — An endorsement of the methods of the U. S. Biological Survey.

Chapman, Alfred. Notes and Observations on the Birds of North Uist in May, 1883. (*Ibid.*, June, 1918.)

Shufeldt, R. W. Anomalies to be Found Among Ordinary Birds. (Scientific American Supplement, No. 2207.)

Wetmore, Alexander. Description of a New Subspecies of the Little Yellow Bittern from the Philippine Islands. (Proc. Biol. Soc. Wash. 31, pp. 83-84, June 29, 1918.) — *Ixobrychus sinensis astrologus* (p. 83) Luzon.

Hollister, N. The Yellow Rail in the District of Columbia. (*Ibid.*, p. 93, June 29, 1918.) — One captured May 20, 1917.

Zimmer, John T. Instinctive Feeding Habits of Young Herons. (*Ibid.*, p. 94.) — Young herons invariably speared fish placed in a pan of water on the first thrust and as invariably missed those placed on the floor. The refraction of light passing through the water is suggested as the reason, the birds being accustomed to take their food from shallow water aim their thrusts accordingly.

Oberholser, H. C. *Aristonetta* a Good Genus. (*Ibid.*, p. 98.) — In the opinion of the author this name should be revived for the Canvasback.

Oberholser, H. C. *Spizilla monticola* (Gmel.) the Correct Name for the North American Tree Sparrow. (*Ibid.*, p. 98.) *Fringilla canadensis* Bodd. has been cited as an earlier name for this bird but it proves to be based on the young of some other species, possibly the White-throated Sparrow.

Pitt, Frances. The Colour Changes of the Beak and Shield of the Young Moorhen (*Gallinula c. chloropus*). (Novitates Zool., XXV, No. 1, May 1918.)

Hartert, Ernst. Types of Birds in the Tring Museum. (*Ibid.*) — The Brehm Collection.

Hartert, Ernst. On the Genus *Calandrella*. (*Ibid.*)

Van Someren, V. G. L. A Further Contribution to the Ornithology of Uganda (West Elgon and District). — (*Ibid.*) — *Linurgus elgonensis* (p. 283) sp. nov.

Baker, E. C. Stuart. Some Notes on the Dicruridæ. (*Ibid.*) — New forms described are: *D. leucophaeus disturbans* (p. 293), Amherst, Malay Peninsula, *D. l. hopwoodi* (p. 294), Dacca, *D. l. stevensi* (p. 295), Darjeeling, India and *D. l. minimus* (p. 296), Ceylon, *D. ater harterti* (p. 299), Formosa and *D. paradiseus nicobariensis* (p. 302), Nicobars.

Hartert, Ernst. Notes on Penduline Tits. (*Ibid.*)

Allen, A. A. The Diurnal Birds of Prey — Hawks, Eagles and Vultures. (American Forestry, XXIV, pp. 281-284.)

Allen, A. A. The Pigeons and Doves. (*Ibid.*, pp. 428-432.)

Allen, A. A. The True Hawks. (*Ibid.*, pp. 357-361.) Admirable popular articles with a wealth of excellent illustrations from photographs.

Oberholser, H. C. The Common Ravens of North America. (Ohio Jour. of Sci., XVIII, No. 6, April, 1918.) — *Corvus corax europhilus* (p.

215), type locality Alabama, is proposed for the Raven of eastern U. S. and southern Canada. *C. c. sinuatus* is limited to central U. S. and Central Mexico, and *C. c. clarionensis* extended to include birds of extreme N. W. Mexico and S. W. United States. *C. c. principalis* remains the form of the far north.

Oberholser, H. C. Diagnosis of a New Genus of Timaliidae. (*Jour. Wash. Acad. Sci.*, VIII, No. 12, January 19, 1918.) — *Sterrhoptilus* (p. 394), new genus based on *Mixornis capitalis*.

Baker, E. C. Stuart. The Game Birds of India, Burma and Ceylon. Pt. XXIII. (*Jour. Bombay, Nat. Hist. Soc.* XXV, No. 3, January 15, 1918.)

Anderson, Johannes C. New Zealand Bird-song. Further Notes. (*Trans. and Proc. N. Z. Inst.* XLIX, December 20, 1917.) — Claims a similarity to human music.

De Ferris, F. Contribution to a Study of the Cries and Songs of Birds in Relation to Music. (*Bull. Inst. Gen. Psychologie*, XVII, No. 4-6.) [In French.]

Colthrup, C. W. Some Observations on Birds' Songs and Calls. (*Wild Life X*, No. 3, March 1918.)

Mullens, W. H. Bullock's London Museum. (*The Museum's Journal* [London], XVII, Nos. 4, 9 and 12.) — An important account of this historic museum and its collections.

Swales, B. H. The Purple Sandpiper at Cleveland, Ohio. (*Occasional Papers of the Museum of Zoölogy, Univ. of Mich.*, No. 57, June 20, 1918.) — September 3, 1883.

Oberholser, H. C. The Criterion of Subspecific Intergradation in Vertebrate Zoölogy. (*Science*, August 16, 1918.) — In the course of his discussion the author says that the 'degree of difference principle' so strongly advocated by Dr. C. Hart Merriam "has been found unsatisfactory." This statement would seem to be rather too sweeping as many ornithologists of the highest standing regard as subspecies forms which differ but slightly but do not intergrade, so long as their ranges are distinct. In a very large number of cases too our judgment is actually based on the amount and character of the difference, the intergradation being inferred. As in many other evolutionary problems we shall probably ultimately consider several factors in reaching a conclusion rather than try to bind ourselves to one principle only (cf. p. 487).

Publications Received.— **Bailey**, Florence Merriam. Birds of Glacier National Park. (General Information regarding Glacier National Park Season of 1918, pp. 52-64.)

Bancroft, W. F. Directory of Officials and Organizations Concerned with the Protection of Birds and Game, 1918. (U. S. Department of Agriculture, Biological Survey.)

Bangs, Outram. (1) Vertebrata from Madagascar. (*Bull. Mus. Comp. Zool.*, LXI, No. 14, pp. 489-511.) (2) Notes on the Geographical Races of *Tangara gyroloides*. (*Proc. N. E. Zool. Club*, VI, pp. 73-76, December 21, 1917.)

Bangs, Outram and **Noble**, G. K. Description of a New Woodpecker from Peru. (Proc. N. E. Zool. Club, VI, pp. 85-86. June 7, 1918.)

Dwight, Jonathan, M. D. The Geographical Distribution of Color and of other variable Characters in the Genus Junco: a new Aspect of specific and subspecific Values. (Amer. Mus. Nat. Hist. Bull., XXXVIII, pp. 269-309. June 1, 1918.)

Grinnell, J. (1) The Name of the American Barn Swallow. (The Condor, XX, p. 92, March, 1918. (2) Seven New or Noteworthy Birds from East-Central California. (*Ibid.*, pp. 86-90.) (3) The Subspecies of the Mountain Chickadee. (Univ. of Cal. Publ. in Zool., Vol. 17, pp. 505-515. May 4, 1918.)

Hollister, N. The Yellow Rail in the District of Columbia. (Proc. Biol. Soc. Wash., Vol. 31, pp. 93, June 29, 1918.)

McAtee, W. L. Attracting Birds to Public and Semipublic Reservations. (Bull. 715, U. S. Dept. Agriculture, August 12, 1918.)

Mathews, Gregory M. The Birds of Australia. Vol. VII. Part II. May 15, 1918. London, Witherby & Co.

Nichols, J. T. An Aspect of the Relation Between Abundance, Migration and Range in Birds. (Science, XLVIII, No. 1233, August, 16, 1918.)

Shufeldt, R. W. Anomalies to Be Found Among Ordinary Birds. (Scient. Amer. Suppl., No. 2207, April 20, 1918.)

Skinner, M. P. Birds of the Yellowstone National Park. (General Information Regarding Yellowstone National Park. Season of 1917, pp. 54-59.)

Soper, J. Dewey. The Birds of Edmonton. (Ottawa Naturalist, XXXI, Nos. 11 and 12, February and March, 1918.)

Swales, Bradshaw H. The Purple Sandpiper at Cleveland, Ohio. (Occas. Papers Mus. Zool. Univ. of Mich., No. 57, June 20, 1918.)

Swarth, H. S. The Subspecies of the Oregon Jay. (The Condor, XX, pp. 83-84, March, 1918.)

U. S. Dept. of Agriculture. Migratory Bird Treaty and Regulations. (August 26, 1918.)

Wetmore, Alexander. The Duck Sickness in Utah. (Bull. No. 672, U. S. Dept. of Agr., June 21, 1918.)

Wood, Norman A. (Occas. Papers Mus. of Zool. Univ. of Mich., No. 50, April 8, 1918. Notes on the Birds of Alger County, Michigan.)

American Museum Journal, XVIII, No. 5, May, 1918.

Ardea, VII, No. 1-2.

Audubon Bulletin, Spring and Summer 1918.

Austral Avian Record, The, III, No. 6, June 25, 1918.

Avicultural Magazine, (3), IX, Nos. 8 and 9, June and July, 1918.

Bird-Lore, XX, No. 4, July-August, 1918.

Bird Notes and News, VIII, No. 2, Summer, 1918.

Bluebird, The, X, Nos. 6 and 7, May and June, 1918.

British Birds, XII, Nos. 1, 2 and 3, June-August, 1918.

Bulletin British Ornithologists' Club, Nos. CCXXXIV and CCXXXV, May 22, and July 25, 1918.

- California** Fish and Game, Vol. 4, No. 3, July, 1918.
Condor, The, XX, No. 4, July-August, 1918.
Current Items of Interest, Nos. 37 and 38, June 29 and July 1, 1918.
Emu, The, XVIII, Part I, July, 1918.
Fins, Feathers and Fur, No. 14, June, 1918.
Ibis, The, (10), VI, No. 3, July, 1918.
New Jersey Audubon Bulletin, No. 26, July 1, 1918.
Oölogist, The, XXXV, Nos. 7 and 8, July and August, 1918.
Ottawa Naturalist, The, XXXI, No. 12, March, 1918 and XXXII, No. 1, April, 1918.
Proceedings of the Academy of Natural Sciences of Philadelphia, LXX, Part I, 1918.
Revue Française d'Ornithologie, Nos. 108, 109, 110, 111, April-July, 1918.
Science, N. S., Nos. 1225-1237.
Scottish Naturalist, The, No. 77 and 78, June, 1918.
South Australian Ornithologist, The, III, Nos. 36 and 7, April and July, 1918.
Wilson Bulletin, The, XXX, No. 2, June, 1918.
Zoological Society Bulletin, XXI, Nos. 3 and 4, May and July, 1918.
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CORRESPONDENCE.

Concerning a Certain Tendency in Systematic Ornithology.

EDITOR OF 'THE AUK':

The more I think of it, the more dangerous appears to me to be the stand of those few who would assign to an extreme of one subspecies or species (an individual from within the breeding range of that form as typically represented by the mean) the name of an essentially different subspecies or species which that individual happens to resemble.

To illustrate, Dr. Dwight in his recent essay on the Genus *Junco* (Bull. Amer. Mus. Nat. Hist., vol. XXXVIII, 1918, pp. 269-309, 5 text-figs. [maps], pls. XI-XIII), cites (p. 293) the case of a series of breeding juncos, one hundred males, all from one locality in the Sierra Nevada of central California. He finds in this series, with regard to one character, color, variations which lead him to refer about seventy-five percent (with pinkish brown backs) to *thurberi*, fifteen percent (with browner backs) to "*couesi*," and a smaller percentage (with deeply ruddy backs) to *oregonus*. Of course, as pointed out by him, there are further variations, and also these categories are not sharply demarked. Dwight says (p. 294): "I do not see how we can escape the necessity of calling a specimen *oregonus* or

thurberi, or any other name, if it shows the characters of the form, no matter where it is taken."

Do not my readers immediately see, with me, the extreme danger into which the spread of this conviction will inevitably lead our science? What will be the value of subspecific determinations by Dwight, Bishop and the others of like mind, in accurate studies of migration and of distribution in general? Can they be used at all, without incurring the risk of making wholly incorrect inductions? If such practice becomes universal, wherein could there be any further use at all for recognizing subspecies and slightly differentiated species? Would we not have to restrict ourselves to dealing with simply black-headed juncos, slate-colored juncos, and gray-headed juncos, or, safer yet, with just *juncos*?

The rational employment of the subspecific concept as different from the specific one requires the exercise of judgment based on experience — just such as is needed in any other advanced field of knowledge. Furthermore, the essential factor involved in the use of trinomials (as designating subspecies as distinguished from species) is variation. After years of study on the part of scores of systematists in ornithology and mammalogy, there are admitted by all, I believe, but two criteria for use of the trinomial: (1) relatively small degree of difference, and (2) the fact of intergradation either through individual variation (as in insular races) or through geographical blending, where the ranges are continuous. Intergradation has always been, among the greatest number of vertebrate systematists, the basis for the use of the subspecies concept, and it should continue so to be. Now, the existence of normal fluctuational variation in two forms means that there *has* to be overlapping where the means are sufficiently close together; in other words, intergradation occurs, and the convergent extremes will be alike. In any case, if we take a considerable number of representatives of an animal which is subject to geographic differentiation, from one locality, and another lot from another locality, in a separate area of differentiation, and plot graphically their different characters separately, which is essentially what Dwight has done with color in the Genus *Junco*, we find that some of the specimens fall together, as demonstrated by him in this particular case; but who, until now, would think of calling such individuals as fall in the small area of coincidence of the polygons by other than the name of the race to which they geographically and *genetically* belong!

I insist, Dwight's repeated assertions to the contrary notwithstanding, that we simply *must* consider locality inhabited as one of the most important characters possessed by a species or subspecies. Otherwise, our efforts to classify specimens as to species and subspecies are liable to be worthless. From time immemorial "habitat" has been included as one of the first and most important diagnostic characters of a species. Why begin to disregard it now!

The main object of classification, from top to bottom, is to express *genetic relationship*, irrespective of superficial resemblances or such as may

obtain in the normal behavior of fluctuational variation. This is, as everyone knows, a formidable problem, one that is likely never to be solved to our complete satisfaction because of some of just those difficulties that Dwight complains of throughout the paper cited. But we are going to approach far closer to the ideal than the present stage—provided the work of the open-minded, painstaking yet optimistic student continues to dominate the field.

JOSEPH GRINNELL.

California Museum of Vertebrate Zoölogy,
July 9, 1918.

A Correction.

EDITOR OF 'THE AUK':

My thanks are due to Mr. Alexander Wetmore, not alone for the pleasure, shared with other readers of 'The Auk,' in perusing his valuable contribution on 'The Birds of Desecheo Island, Porto Rico,' but also for having therein called my attention to a hitherto overlooked slip of the pen in my article 'A Day on De Cicheo Island' (*Oölogist*, 1900), whereby (page 117, second paragraph), I referred to the "Sooty Tern" instead of to the Noddy, as should have been the case. This error certainly requires correction, even at this late date.

Of course the character of the slip is at once apparent on referring to my paper on the 'Birds of Porto Rico' (*Auk*, 1902-03), wherein (1902, pages 357-358) the Sooty Tern is correctly recorded as noted only on Mona Island, the Bridled Tern and Noddy, however, having been noted on both Mona and Desecheo Islands.

B. S. BOWDISH.

Newark, N. J., July 11, 1918.

NOTES AND NEWS.

ALL readers of 'The Auk' are familiar with the changes which are continually being proposed in the technical names of our birds and are doubtless reminded of the old saying that 'A rose by any other name will smell as sweet.' Those actively interested in nomenclature know that many of these proposed changes, as well as similar ones in other branches of zoölogy and botany, are necessary in order to conform to the rules adopted to bring about uniformity in scientific nomenclature. What strides have been made toward uniformity and stability in bird names under these rules may be realized by comparing the 'Hand-List' of the B. O. U. and the A. O. U. 'Check-List' (cf. *Auk*, 1915, p. 243).

Other proposed changes involving the acceptance or rejection of newly described races, subdivisions of genera etc., depend upon individual opinion and can only be decided by an authoritative list prepared by a committee

of arbitration. Such a list is our A. O. U. 'Check-List' prepared by the A. O. U. Committee on Classification and Nomenclature, and the great majority of our readers who are not interested in the technicalities of nomenclature turn to this check-list when they wish to make use of scientific names.

This work can of necessity never be up to date and for the convenience of those who wish to keep up with the technicalities a series of annual lists of *proposed* changes and additions to the 'Check-List' appears in the April issue of 'The Auk,' compiled by Dr. Harry C. Oberholser and embodying the compiler's opinions upon certain of the cases. These lists however, carry no further authority and no action has as yet been taken by the A. O. U. Committee on any of the cases contained therein.

It seems desirable that this fact be strongly emphasized since the 'Lists' have been confused by some with the 'Supplements to the Check-List' issued under the authority of the Committee. A case in point is Mrs. Florence Merriam Bailey's excellent 'List of the Birds of Glacier National Park' which is stated to follow the '1910 A. O. U. Check-List revised to the April 1918 Auk.' As the list of proposed changes in the April 1918 'Auk' and its predecessors contain no decisions by the A. O. U. Committee it is obvious that any "revision" of the 'Check-List' based upon them is purely the selection or rejection of such names there included as the author may choose.

While in technical papers representing original research in nomenclature it is perfectly proper for an author to propose or endorse names differing from those used in the 'Check-List,' it seems most undesirable to do so in local North American lists or in popular articles or such as are written for public instruction, as Mrs. Bailey's list above quoted or Dr. Oberholser's census of birds in the vicinity of Washington, D. C. (see *antea* p. 492). In the latter only technical names are used and as the average reader of the census will be unable to locate a number of them in the A. O. U. 'Check-List,' the only check-list available to him (or in any other, for that matter) he will be unable to understand what birds Dr. Oberholser is writing about. We do not question the accuracy of Dr. Oberholser's nomenclature — there are few better authorities on the subject — nor the probability that the A. O. U. Committee will ultimately endorse most of his decisions, but until they do so it seems that the use of these "advanced" names in such publications retards instead of advances ornithology. We must consider our readers and write in the language that they can understand.

That it is not necessary to be "up to the minuit" in matters of nomenclature in order to do excellent ornithological work may be seen in the publications of the members of the Cooper Ornithological Club. Our Californian co-workers it is true recognize certain races not accepted in the A. O. U. 'Check-List' but in matters of pure nomenclature, generic division, etc., they are content to follow the 'Check-List.'¹ 'The Auk' has not

¹ Names of new races not yet included in the 'Check-List' may of course be employed if desired with footnotes showing their equivalents in the 'Check-List' nomenclature.

been as careful as it should have been in this matter but in the future all contributors will be requested to conform strictly with the 'Check-List' in all local lists unless footnote equivalents are given.

This whole matter takes on a very much more serious aspect just at present, for, as will be seen below, the time is ripe for a very much wider uniformity in nomenclature, through the co-operation of all English speaking ornithologists, and unless we agree to sink our personal preferences so far as ordinary publications go and use the nomenclature endorsed by our national organization, what hope can there be for international agreement?

We do not in any way wish to criticise the excellent papers which we have used as examples. They simply happened to be among the publications reviewed in this issue. It is the *principle* that we are considering and we feel sure that most or all of those who have employed "advanced nomenclature" for "every day use" did so thoughtlessly or were mislead as to the character of the 'Lists of Proposed Changes' published in 'The Auk.'—WITMER STONE.

In reviewing the recent 'Hand-List of British Birds' by Dr. Hartert and his associates the Editor of 'The Auk' had occasion to comment upon the remarkable correspondence between the nomenclature there adopted and that of the A. O. U. Check-List in cases where the same genera or species were considered and concluded with the following: "This comparison shows that it will now be very easy for American and British ornithologists to come together on matters of nomenclature."

The time for bringing about this result seems to have arrived, thanks to the initiative taken by the Committee of the British Ornithologists' Union. Some months ago they appointed a committee on a 'Systema Avium' consisting of Lord Rothschild, Drs. Eagle Clark and Hartert, Messrs. G. M. Mathews, T. Iredale, W. L. Sclater, E. C. Stuart Baker and C. Chubb. It was proposed that this committee enter into correspondence with the A. O. U. to propose a joint list of bird names of the world to be known as the 'Systema Avium.' The suggestion is that the work consist of six volumes covering the six great zoölogical regions, the A. O. U. being responsible for North and South America and the B. O. U. for the Old World volumes, and that a joint committee settle all questions of nomenclature of genera and species where they are not already in accord.

The matter will come before the A. O. U. at its next meeting and it is to be hoped that in the near future the actual work may be under way although publication will of course be out of the question until after the war. Such a work endorsed by all the English speaking people of the world would go a long way toward establishing a universal nomenclature for birds.

As is generally known legislation for the protection of migratory birds in North America has taken the form of a treaty between the United States and Great Britain, putting the matter on a more stable and permanent basis than could be done in any other way. After being ratified by both

governments the treaty was proclaimed by the President on December 8, 1916. Canada by an act of Parliament gave full effect to the convention August 29, 1917, and issued regulations, May 11, 1918. Congress took similar action on July 3, 1918 and on the 31st of the same month President Wilson issued a proclamation containing regulations for the enforcement of the treaty in the United States, so that the treaty is now in full force.

The birds covered by the regulations include the Anatidæ, Gruidæ, Rallidæ, Limicolæ, Columbidae and all migratory insectivorous birds as well as Grebes, Loons, Auks, Herons, Gulls and Terns, Petrels and Shearwaters. The open seasons correspond closely with those previously in force under the Migratory Bird Law, but everyone should secure a copy of the pamphlet issued by the Department of Agriculture which contains the text of the treaty and the regulations.

The section which especially interests field ornithologists is that dealing with collecting for scientific purposes. Every collector of birds or eggs must hereafter have a permit from the Secretary of Agriculture, and anyone collecting without such permit will be vigorously prosecuted by the Federal authorities. Permits may be obtained without cost by applying to the Secretary of Agriculture but the applicant must have the endorsement of two well-known ornithologists. Blanks for application may be had from the Department of Agriculture, Washington, D. C.

COL. WILLIAM VINCENT LEGGE, a Corresponding Fellow of the American Ornithologists' Union, died at his home in Tasmania on March 25, 1918, in his 75th year. He was born at Fullenswood, near St. Mary's, Tasmania, September, 1841, the son of R. V. Legge one of the earliest settlers of the country. We learn from 'The Emu,' that he went to England with his parents at the age of 12, crossing the isthmus of Panama on mule back. He was educated at Bath and also in France and Germany, becoming an accomplished linguist. Receiving his commission in the British Army in 1862 he was successively stationed in England, Melbourne and Ceylon his final appointment being Commandant of the Tasmanian Military forces, which position he held for eleven years, retiring from the service after the Boer War. His later years were spent in agricultural pursuits on his home estate.

Col. Legge's chief interests outside of his profession were, forestry, physiography and ornithology. He was one of the founders of the Royal Australasian Ornithologists' Union and its first president. During his nine years service in Ceylon he gathered the materials for his most important ornithological work, 'The Birds of Ceylon' in two volumes, quarto, with colored plates, which he published during a subsequent staff appointment in England. During his sojourns in that country he was very intimate with the late Dr. Bowdler Sharpe and frequently visited John Gould, the "father of Australian ornithology." Among Col. Legge's other ornithological publications may be mentioned, his 'Systematic List of Tasmanian Birds. The Geographical Distribution of the Australian Limicolæ'

while he took an important part in the compilation of the List of Vernacular Names of Australian Birds' and the R. A. O. U. Check-List.

DR. ROBERT LATSHAW WALKER, an Associate Member of the A. O. U., died at Carnegie, Pa., November 19, 1916, in his seventy-ninth year. Dr. Walker was born in Pittsburgh, July 26, 1838, and at the age of sixteen removed with his parents to Woodville, where he grew to manhood. His early education was obtained at the Western University of Pennsylvania (now University of Pittsburgh), and he took his medical degree at the University of Pennsylvania. In 1866 he began the practice of his profession in what was then Mansfield Valley, now the borough of Carnegie. Dr. Walker was always a lover of outdoor sports and natural history, and had amassed a library of considerable size on these subjects, of which ornithological books formed a large part. He was elected an Associate Member of the A. O. U. in 1888, and while he did not, so far as known to the writer, contribute to the ornithological magazines, he was well informed on the subject in general, and took a great interest in the progress of the science. Dr. Walker had a personality that endeared him to a large circle of friends and acquaintances, by whom he is surely missed.—W. E. CLYDE TODD.

PROFESSOR JONATHAN YOUNG STANTON, an Associate of the American Ornithologists' Union, 1883–1918, died at his home in Lewiston, Maine, February 17, 1918, of pneumonia after a short illness.

Professor Stanton was born in Lebanon, Maine, in June, 1834, and graduated from Bowdoin College in the class of 1856. He took up the study of law in the office of D. C. Christie, Dover, N. H., for a time; but relinquishing the law, with the exception of two or more years at the Theological Seminary at Andover, Mass., devoted himself to the office of a teacher: two years in the New Hampton Institution, New Hampshire, and two years as principal of Pinkerton Academy, Derry, New Hampshire. In 1863 he was elected Professor of Greek and Latin in Bates College, Lewiston, Maine, holding this position until 1906 when failing health forced him to resign his active professorship, when he was made Professor emeritus. In 1874 he travelled abroad.

Professor Stanton was a man of broad scholarship, and among numerous other subjects, took a deep interest in the study of ornithology. For many years he conducted classes in this subject both in the lecture room and in the field, and after his retirement in 1906 until about a year before his death continued to give lectures and conduct field classes.

Though of a modest and retiring nature, through a correspondence with prominent naturalists in this country and in Europe, including Darwin and Wallace; and through his long labors at the College, he became widely known to ornithologists and bird lovers. Many a teacher today is passing on the inspiration received from Professor Stanton.

Early in life he began the formation of a collection of birds and an orni-

thological library, which became quite notable and were recently installed in the College museum and library.

With his splendid equipment and profound knowledge, it is to be regretted that he wrote almost nothing for publication. Deeply as he loved the works of nature, his deepest love and sympathy was directed to man, and especially to the young men and women of the College, who came to regard him with an unusual degree of reverence.

At the first meeting of the Maine Ornithological Society, held in Gardiner, Maine, December, 1896, he was elected to Honorary membership.

In 1866 he was married to Harriet P. Woodman of Portland, whom he survived by about twenty-two years.

Two good photographs of Professor Stanton are to be found in Carrie E. Miller's, *Birds of Lewiston-Auburn and Vicinity*, published at Lewiston, 1918.—A. H. NORTON.

THE National Academy of Sciences at its April meeting awarded to Dr. Frank M. Chapman, curator of ornithology at the American Museum of Natural History, the first Daniel Giraud Elliot medal and honorarium, for his recent work on the distribution of bird-life in Colombia.

The Elliot fund was established by Miss Margaret Henderson Elliot in memory of her father and the award is to be made annually for pre-eminence in zoölogy or palæontology. Ornithologists throughout the country, we feel sure, will heartily endorse the action of the National Academy. It is particularly gratifying that an ornithologist should be the first to be so honored and peculiarly appropriate that one so closely associated with Dr. Elliot should receive the first Elliot medal. Incidentally it may be mentioned that on March 1, 1918, Dr. Chapman completed his thirtieth year of connection with the American Museum, being now second in point of seniority on its scientific staff.

DR. CHARLES W. RICHMOND, for many years Assistant Curator of the Division of Birds in the United States National Museum, has recently been appointed Associate Curator. Mr. B. H. Swales has been appointed Honorary Curator of birds' eggs in the same institution.

AGITATION for increasing the catch of fish as an emergency measure for food supply during the war has caused undue agitation against the Pelicans especially in the Gulf States. The National Association of Audubon Societies and the Conservation Commission of Louisiana have undertaken an investigation of the food of the bird and the Audubon Society of Florida has issued a pamphlet in its defence. The reports of its destruction of food fishes have evidently been greatly exaggerated.

At the annual meeting of the British Ornithologists' Union held on March 13, 1918, Dr. W. Eagle Clarke was elected president to succeed Col. R. Wardlaw Ramsey who had served for the last five years. The membership of the Union stands as follows: Ordinary 423, Extraordinary

1, Honorary 8, Honorary Lady (the only lady members) 8, Colonial 9, and Foreign 19. The Honorary and Foreign (equivalent to the Corresponding Class of the A. O. U.) it will be noticed are much more restricted than in the A. O. U. The American ornithologists represented in these classes are as follows:

Honorary, Dr. J. A. Allen, Dr. Frank M. Chapman, Dr. Harry C. Oberholser, Dr. Chas. W. Richmond and Mr. Robert Ridgway.

Foreign, Dr. Leonhard Stejneger and Dr. Witmer Stone.

THE ASSOCIATES OF THE A. O. U.—The By-Laws of the Union provide that Associates shall be unlimited in number but shall be residents of America. So long as a person maintains residence in America he may keep his status as an Associate even though he may reside temporarily in a distant part of the world. Thus at the present time one Associate is living in British Papua, another in Ceylon, and a third in Samoa.

At the first meeting 87 Associates were elected but apparently several failed to qualify, for at the next meeting in spite of the fact that only two deaths had occurred during the year the number was reported as only 63. In April 1918, the total number as shown by the list published in 'The Auk' was 745 including 5 Life Associates. Of these, 142, or nearly 20 per cent were women. Practically all of the 120 persons that have been elected Members and about one half of the present Fellows were originally elected as Associates. In addition to losses by resignation or otherwise the losses by death since the organization of the Union have been 165.

The class of Associates includes several distinct groups. It comprises not only the younger bird students and those who on account of a general interest in birds wish to keep in touch with the progress of bird study, but also those who have a temporary interest in ornithology. The more active ornithologists and especially those who are engaged in bird study in a professional capacity are usually promoted to the classes of Members and Fellows. Unfortunately many of those whose interest is only temporary drop out after a few years so that changes are frequent and extensive. But in spite of these changes the class of Associates forms a very important part of the membership. It includes much of the enthusiasm, vigor and strength of the Union and every effort should be made to stabilize it and increase it to several times its present size.—T. S. P.

CALLED TO THE COLORS.—Since the publication of the July number of 'The Auk' of the third list of A. O. U. members in military service, a few additional names and changes have been reported. The additions are as follows:

BERGTOLD, DR. WILLIAM HARRY, Denver, Colo. Major Medical Corps, U. S. Gen. Hospital No. 21, Denver, Col.

BRITTEN, DR. GEORGE SIDNEY, Syracuse, N. Y. Captain Medical Corps, American Expeditionary Forces, in France.

DICE, LEE RAYMOND, Washington, D. C. Private 5th Co., 2d Training Battalion, 154th Depot Brigade, Camp Meade, Md.

FOWLER, FREDERICK HALL, Palo Alto, Calif. Captain of Engineers, Office Chief of Engineers, Washington, D. C.

FRY, REV. HENRY JACOB, Montclair, N. J. Chaplain U. S. Navy.

LORING, JOHN ALDEN, Owego, N. Y. Captain of Ordnance.

MURIE, OLAUS JOHAN, Moorhead, Minn. Cadet Army Balloon School, Fort Omaha, Nebr.

OVERTON, DR. FRANK, Patchogue, N. Y. Captain Medical Corps, Fort Oglethorpe, Ga.

POOLE, EARL L., Reading, Pa. Signal Service, in France.

SWEENEY JOSEPH A. Halsey, Nebr. Private Co. E, 2d Battalion, 20th Engineers (Forest), American Expeditionary Forces, in France.

The following changes and corrections should also be mentioned. Major Philip J. McCook is now Adjutant of the 9th Brigade in France. Lieut. Francis Harper and Lieut. E. G. Holt have been promoted to 1st Lieutenant and transferred to the Sanitary Corps. Tracy I. Storer has also been commissioned a 1st Lieutenant in the Sanitary Corps and detailed on the laboratory car 'Metchnikoff,' at Fort Sam Houston, San Antonio, Texas. F. C. Lincoln is an acting sergeant in the Pigeon Section of the 293d Aero Squadron at March Field, Riverside, Calif., and Charles H. Rogers is a Sergeant in the 31st Machine Gun Battalion, 11th Division, Camp Meade, Md. Private F. G. Hall is in the Aviation Section of the Signal Corps at Madison Barracks, N. Y. Private F. P. Metcalf has been transferred to the U. S. Signal Corps Radio School at College Park, Md., and Walt. F. McMahon a private in Infantry is now in France. The name of Horace W. Wright was included in the last list through error.

In the Canadian Forces Ernest M. Anderson is in A Co., R. C. R., B. C. Special Service Unit at Quebec; Harrison M. Laing is in the Instructional Section of the School of Aerial Gunnery at Beamsville, Ontario; and Harrison F. Lewis has been discharged on account of disability and is now District Auditor in Militia District No. 5 at Quebec.

Relatives or friends who may have additional information concerning these or other members are requested to communicate at once with the Secretary giving any facts as to rank, branch of the service or present location of members in military service in order that necessary corrections in the list may be made before the annual meeting.

1939 Biltmore St., N. W.
Washington, D. C.

T. S. Palmer,
Secretary.

ATTENTION is again called to the thirty-sixth stated meeting of the A. O. U. to be held at the American Museum of Natural History, New York City, November 12-14, 1918. As many of our members are now serving their country the duty of keeping alive the activities of the society in which all are so deeply interested, devolves upon those who are still at home. It is to be hoped that everyone who can possibly do so will arrange to attend the New York meeting.

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ERRATA.

- Page xxii, line 6 from bottom, after GREGORY, STEPHEN S., for 1916, read 1906.
- | | | | |
|---|--------|---|---|
| " | xxiii, | " | 10, for HARRISON, RICHARD C., read HARRISON, RICHARD E. |
| " | xxx, | " | 26, for STORER, TRACY IRVIN read STORER, TRACY IRWIN. |
| " | 78, | " | 14, for Happy Eagle read Harpy Eagle . |
| " | 110, | " | 8 from bottom, for eighty-three read eighty-four. |
| " | 111, | " | 9, add "and Walter Faxon, 1896-1904." |
| " | 112, | " | 7, for STEINSON read STIMSON. |
| " | 112, | " | 16, omit (F). |
| " | 147, | " | 16, for last read first. |
| " | 235, | " | 15, for griseus read scolopaceus . |
| " | 268, | " | 17, for March 19, 1917 read May 19, 1917. |
| " | 269, | " | 9, omit SCHAEFER, V. F. |
| " | 347, | " | 31, for bimaculatus read australis . |
| " | 350, | " | 28, for Del Monte read Monterey. |
| " | 350, | " | 31, for B. M. read B. H. |
| " | 375, | " | 8, for Mable read Mabel. |
| " | 382, | " | 17, for Agnewo read Agnews. |
| " | 382, | " | 20, for Oct. 6, 1866 read Oct. 1, 1866. |
| " | 386, | " | 8, omit WRIGHT, HORACE WINSLOW. |

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1	1883, Sept. 26-28	1st New York	21	23
2	1884, Sept. 30-Oct. 2	2d New York	16	143
3	1885, Nov. 17-18	3d New York	16	201
4	1886, Nov. 16-18	1st Washington	20	251
5	1887, Oct. 11-13	1st Boston	17	284
6	1888, Nov. 13-15	2d Washington	20	298
7	1889, Nov. 12-15	4th New York	20	400
8	1890, Nov. 18-20	3d Washington	20	465
9	1891, Nov. 17-19	5th New York	14	493
10	1892, Nov. 15-17	4th Washington	20	557
11	1893, Nov. 20-23	2d Cambridge	17	582
12	1894, Nov. 12-15	6th New York	15	616
13	1895, Nov. 11-14	5th Washington	19	667
14	1896, Nov. 9-12	3d Cambridge	14	673
15	1897, Nov. 8-11	7th New York	18	679
16	1898, Nov. 14-17	6th Washington	21	695
17	1899, Nov. 13-16	1st Philadelphia	16	744
18	1900, Nov. 12-15	4th Cambridge	19	748
19	1901, Nov. 11-14	8th New York	18	738
20	1902, Nov. 17-20	7th Washington	25	753
20a	1903, May 15-16	1st San Francisco	7	—
21	1903, Nov. 16-19	2d Philadelphia	19	775
22	1904, Nov. 28-Dec. 1	5th Cambridge	17	808
23	1905, Nov. 13-16	9th New York	17	860
24	1906, Nov. 12-15	8th Washington	24	750
25	1907, Dec. 9-12	3d Philadelphia	20	850
26	1908, Nov. 16-19	6th Cambridge	17	888
27	1909, Dec. 6-9	10th New York	19	866
28	1910, Nov. 14-17	9th Washington	23	897
29	1911, Nov. 13-16	4th Philadelphia	18	887
30	1912, Nov. 11-14	7th Cambridge	18	929
31	1913, Nov. 10-13	11th New York	28	992
32	1914, Apr. 6-9	10th Washington	27	1101
33	1915, May 17-20	2d San Francisco	11	1156
34	1916, Nov. 13-16	5th Philadelphia	26	830*
35	1917, Nov. 12-15	8th Cambridge	21	891

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